THE ENDURING EFFECTS OF JOB DEMANDS ON THE MENTAL HEALTH OF POLICE OFFICERS

Submitted by

Katrina J. Lawson

B. App. Sci. Psych (Hons)

A thesis submitted in total fulfilment of the requirements of the degree of

DOCTOR OF PHILOSOPHY

Faculty of Business

Australian Catholic University (ACU)

Melbourne

December 2011

STATEMENT OF AUTHORSHIP AND SOURCES

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No parts of this thesis have been submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgment in the main text of the thesis.

All research procedures reported in the thesis received the approval of the relevant Ethics Committees.

Signed: _____

ABSTRACT

Occupational stress research has consistently documented significant relationships between work characteristics and employee mental health, with the components of the Demand-Control-Support (DCS) model of occupational stress (i.e., job demand, job control and social support) being widely used to capture work characteristics (Karasek &Theorell, 1990). The work characteristics of the DCS model appear to be key determinants of employee health outcomes for individuals in a diverse range of occupations (de Lange, Taris, Kompier, Houtman, & Bongers, 2003; van der Doef & Maes, 1999).

Although previous research suggests that the DCS model may provide a strong foundation for investigating the effects of the work environment on employee health, the model does not, however, consider the possible effects of the broader organisational context on the health of employees. In light of this criticism, a growing body of research in the last decade (Fujishiro & Heaney, 2007) has begun to compare the influence of work characteristics, as measured by the DCS model, with a concept known as 'organisational justice' in order to broaden the focus of the DCS model and to account for the organisational environment (e.g. Elovainio, Kivimaki, & Vahtera, 2002; Kivimaki, et al., 2005; Kivimaki, et al., 2004; Zohar, 1995). Preliminary results from studies that have compared the effects of work characteristics and organisational justice onto health outcomes tend to indicate that justice is a stronger antecedent of employee mental health than work characteristics. Research studies incorporating both work characteristics and justice are relatively few however and uncertainty remains regarding the relative importance of justice. The lack of clarity as to whether organisational justice captures greater variation in employee health outcomes than work characteristics may be due, at least in part, to metholodigical issues in previous studies.

In particular, previous justice research that has controlled for the effects of the DCS components have not tended to incude the full complement of organisational justice types and have often assumed direct or linear relationships between antecedents and health outcomes. In order to provide some clarity regarding the importance of organisational justice, this thesis seeks to compare the predictive ability of work characteristics and organisational justice in terms of mental health among a sample of police officers. The possibility of curvilinear relationships and/or interaction effects will be considered and the four empriically distinct types of organsiational justice will each be included as antecedents to offer transperency about how different fairness perceptions affect employee mental health. The relationships between three mental health indicators will also be investigated and the possible prevalence of work-related depression in Australia will be explored.

Data for this thesis was obtained in 2005 and 2006 as part of a larger ARC project. Hierarchical multiple regression analyses found that job demands were significantly related to mental health outcomes at both baseline and one year follow-up. The effects of job level resources, in the form of job control and social support, were largely limited to concurrent mental health. Similarly, the unique effects of organisational justice were restricted to short term mental health, particularly job satisfaction. Therefore, although there is some potential for organisational justice to promote employee mental health, the effects of job demands on employee health appear to be considerably more important. Ongoing monitoring of job demands, including the number of demands faced and time pressures, may avoid a situation where employee mental health is compromised. Without preventative health promotion strategies, the consequences of job demands may have adaptation effects that are detrimental to employee mental health.

STATEMENT OF APPRECIATION

This doctoral thesis would not have been possible without the support of many people.

I would like to thank my principal supervisor, Professor John Rodwell, who encouraged me to pursue a PhD in organisational psychology. Professor Rodwell has provided invaluable assistance, support and guidance throughout the entirety of my PhD. I look forward to working with Professor Rodwell as part of his research team.

I would like to also show my gratitude to Associate Professor Andrew Noblet of Deakin University, whose knowledge and assistance helped shape my research and ultimately led to the publication of my first journal article.

Thank you to both Deakin University and the Australian Catholic University for financially supporting my thesis project through the provision of separate post graduate scholarships during my time at each university.

I would like to extend my gratitude to the members of the police force who participated in the original research project from which this thesis has arisen.

To my parents, Jane and Ray, thank you for your love, support and understanding during the long years of my education.

A heartfelt thank you to my husband Lindsay, your encouraging words and support instilled confidence in me to soldier on. And finally, thank you to my son Hamish, you are my greatest motivator.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1: INTRODUCTION

1.1 Background to the Thesis

An extensive body of research demonstrates that employee stress can have negative effects on organisational and individual health outcomes. The causes of stress may be diverse, however, it is well established that the characteristics of an employee's job are key contributors to 'feeling stressed' and can consequently lead to stress-related health outcomes, including poor mental health.

Transactional models of stress take the perspective that the likelihood of employee stress depends on both the demands or stressors an employee faces and their level of available resources. In particular, whether or not the available resources are sufficient to counteract the adverse affects of stressors will determine the likelihood of an employee experiencing stress or associated health problems. According to the Demand Control Support (DCS) model, there are three characteristics that are fundamental to whether an employee experiences psychological strain, namely job demands, job control and social support (Karasek & Theorell, 1990). In particular, psychological stress reactions are likely to result if ones job is "high strain" in nature, characterised by high work-related demands, few opportunities for control or autonomy, and/or insufficient social support (Karasek, 1979; Karasek & Theorell, 1990). Although the job characteristics of the DCS model have been associated with numerous health outcomes in both cross-sectional and longitudinal research studies (see Hausser, Mojzisch, Niesel, & Schulz-Hardt, 2010; van der Doef & Maes, 1999), it has recently been suggested that a concept known as "organisational justice" may make an independent or unique contribution to employee health over and above the contribution/s provided by the more commonly studied job characteristics. Although organisational justice

has demonstrated a significant relationship (above job characteristics) with employee health outcomes including self-rated health, minor psychiatric disorders (Elovainio, et al., 2002), risk of coronary heart disease and risk of poor self-rated health (Kivimaki, et al., 2005; Kivimaki, et al., 2004) the number of studies that have investigated the effects of organisational justice on health after controlling for psychosocial work characteristics are limited in number. Further, there is inconsistency within the limited studies that have been conducted as to whether the effects of one, two or three types of organisational justice are investigated, leading to fragmentation (Ambrose & Arnaud, 2005). Finally, there are few, "if any", previous organisational justice studies that have considered the impact of justice on measures of more severe mental health, such as psychological distress or depression (Tepper, 2001). Job characteristics research is similarly limited, with psychological wellbeing tending to be the only measure of mental health investigated.

In light of the restricted number of studies that have investigated the impact of organisational justice on mental health, while controlling for job characteristics, as well as the limitations of past research in terms of tending to use one mental health outcomes, this thesis will build upon the DCS model and include organisational justice and seek to determine the unique impact of organisational justice on a range of mental health outcomes.

1.2 Aim and Scope

The aim of this thesis is to compare the predictive ability of job characteristics and organisational justice in terms of a range of mental health indicators. In order to fulfil this aim, one of the most commonly utilised transactional models of stress, the DCS model, will be expanded to include dimensions of organisational justice. The decision to investigate the potential for organisational justice dimensions to significantly contribute to employee mental

health over and above the influence of job characteristics is based on a growing body of work within organisational psychology that has begun to emerge in the last decade. In line with this new field of research and to aid comparison across recent research findings and this thesis, the job characteristics included in this thesis are limited to the components of the DCS model.

1.3 Overview of the Thesis

In order to achieve the aim of this thesis, the literature surrounding employee stress and organisational justice will be examined in Chapter 2. A critical review of these bodies of literature reveals that although job characteristics are well accepted as being key determinants of mental health, transactional models of stress that are used to guide job characteristics research fail to consider the influence of the broader organisational environment on stress-related outcomes. Consequently, there has been a recent move within organisational psychology in the past decade to investigate the impact of organisational justice on employee health outcomes. Empirical justice-health studies are few however, due to being a relatively new development, and tend to be unduly limited in regards to the number of organisational justice types investigated. Similarly, an exploration of the literature indicates that there is a propensity to focus on the effects of job characteristics and/or organisational justice on health at the expense of more severe indicators of mental health. The occupation of policing will then be discussed in terms of employee stress and mental health. Finally, the seven specific research questions that developed from examination of the literature will be presented at the end of the second chapter.

Based on previously conducted research discussed in Chapter 2, Chapter 3 in this thesis presents the methods used to conduct the research. The broader research project from which this thesis draws, including its design and the overall sample, will first be discussed.

Following this, the predictor variables (i.e., antecedents) and the target variables (i.e., outcomes) utilised in this thesis will be presented. Descriptions of the methods for each of the three studies are presented separately, detailing the study design and procedure, participants and instruments used within each study.

The results of the three studies are presented separately in Chapter 4. The data preparation for each study is discussed first including the results of assumptions testing. For the first and second studies, the correlation coefficients are presented followed by the results of hierarchical regression analyses. Results of receiver operating characteristic (ROC) curves are presented in the results section for the third study.

In Chapter 5 of this thesis, the results are discussed in detail and are interpreted in light of previous research. The influences of the job characteristics on mental health will be discussed first and the results obtained will be compared to previous similar research. Following this, the results will be explored in terms of organisational justice in order to address the aim of the research and determine whether justice contributed to mental health beyond job characteristics. Comparisons will also be drawn between the context-free measures of mental health utilised in this thesis in terms of how they relate to the mental health of the broader Australian population. The implications of this research will be explored and a conclusion will be drawn.

CHAPTER 2: LITERATURE REVIEW

This literature review has been divided into seven sections. In the first section, the concept of stress and its interdisciplinary background will be briefly reviewed. The discipline areas of engineering, physiology/medicine and psychology, in particular, will be explored in terms of how they have contributed to today's conceptualisation of what is commonly thought of as "stress". Enquiring into the development of the stress concept uncovers that stress is consistently regarded across the various disciplines as a negative phenomenon, regardless of whether it concerns a man-made structure or a living organism. The psychological perspective of stress, however, appears to dominate modern stress research due to its consideration of human influences and processes.

In addition to contributing to the development of the stress concept, a number of disciplines have similarly contributed to what are widely accepted as the four theoretical approaches to stress research, known as the stimulus, response, interactional and transactional approaches, discussed in depth in section two. The stimulus approach to stress is linked to the engineering discipline and considers environmental stimuli as an antecedent to the experience of stress or ill health, particularly if exposure is excessive. A major limitation of the stimulus approach, as demonstrated by what is known as life events research, is the approaches' failure to consider the potential for individual perception to alter the stimuli-stress relationship. In other words, a circumstance that may generally be regarded as a stressor will not always result in a stress response, and instead depends on the background and characteristics of the particular individual affected.

The second theoretical approach to stress is similarly thwarted by this limitation. The response approach, which is supported by the medical discipline, is concerned with the health

of individuals, particularly physiological health, after exposure to stressors. Similar to the stimuli approach, the response approach does not account for individual differences and fails to recognise that the same event is not likely to trigger an identical response from all persons. Further, the stimuli and response approaches are each limited to one aspect of the stimuli-stress relationship, either the stimuli or the stress response, neglecting to consider the full process.

In comparison, the two theoretical approaches to stress that have a foundation in the psychology discipline incorporate both antecedents and outcomes of the stress process. The first of the psychological approaches, the interactional approach, overcomes the limitations of the previous approaches and considers the individual and other environmental factors that may intervene between stimuli and the stress response and acknowledges that the stress process may also be bi-directional. However, the interactional approach has been criticised for being imprecise. The second psychological approach, known as the transactional approach is argued to be advantageous compared to the alternative approaches, giving consideration to the whole stress process (i.e., stressors and response), as well as the influence of the individual in the form of cognitive appraisal. Upon encountering stimuli, this approach suggests that individuals determine whether they have sufficient resources to cope with the stressor that would consequently enable them to avoid the experience of stress. Alternatively, if a person's resources are deemed to be insufficient during the process of cognitive appraisal, a stress response may be more likely to result. It is perhaps the robustness of the transactional approach, accounting for the whole stress process as well as the individual, which has led to the development of a number of transactional models of stress.

Transactional models of stress will be explored within the third section of this literature review. As evidenced by a review of the general stress literature, there are a number of transactional models of stress, each of which captures the impact of both stressors and resources on a person's health. In this review, the Conservation of Resources (COR) model and the Job Demands-Resources (JDR) model will firstly be examined. Following this, the most widely used transactional model of stress, the Demand Control Support (DCS) model, will be presented. Similar to the COR and JDR models, the DCS model also highlights the importance of both stressors and resources. The individual components of the DCS model (i.e., job demand, job control and social support) will be discussed in detail and previous research that has been conducted using the DCS model will be reviewed. Particular attention will be paid to studies that have examined curvilinear and/or interaction effects between the DCS components and health outcomes. The DCS model will form the foundation for the studies in this thesis.

The fourth section of this literature review will introduce the concept of organisational justice and the four dimensions of organisational justice; distributive, procedural, interpersonal and informational justice. The results of research studies that have explored associations between organisational justice and health outcomes will be examined. Although justice-health studies are relatively limited due to being a moderately new area of enquiry, there is evidence to suggest that organisational justice shares strong links to health outcomes. The predictive utility of organisational justice needs to be further investigated however against more traditional work characteristics, such as those that form the DCS model.

Section five explores the concept of employee mental health. Within the occupational stress literature, researchers tend to use psychological wellbeing as the sole measure of

employee mental health. There is evidence to suggest, however, that future studies would benefit from including additional measures of general mental health, particularly those of increased severity, such as psychological distress and depression. In addition, a measure of mental health specific to the workplace, in the form of job satisfaction specifically, would be of value to research projects investigating the impact of work characteristics on the mental health of employees.

The occupation of policing will be discussed in the sixth section of this literature review. The operational and organisational stressors that police officers encounter during their line of work will be explored and compared in terms of their impact on general mental health. The antecedents of police officer job satisfaction, a job-specific measure of mental health, will also be explored. Although job satisfaction is a popular research area, a review of the literature indicates that a limited number of studies have investigated police officers' satisfaction with their work.

In the final section of this review, the significance of the proposed research and the overall aims of the project will be presented. Finally, the three separate studies that comprise this project will be introduced to the reader.

2.1 Stress: An Interdisciplinary Concept

The concept of stress is generally agreed to be interdisciplinary (Cooper & Dewe, 2004) and there are three disciplines that its development is largely attributed to; engineering, physiology/medicine, and psychology (Cox & Griffiths, 1995). Within the literature, 'stress' is often assumed to have matured in a methodical fashion from the engineering discipline through to the psychology discipline (Cooper & Dewe, 2004). Although the engineering and

medical disciplines did perhaps provide the most "obvious" and earliest theories of stress (Cox & Griffiths, 1995) there is evidence to suggest that the meaning of 'stress' developed rather autonomously within each discipline with little collaboration between them (Cooper & Dewe, 2004).

Stress, according to the engineering perspective, is considered in terms of an environmental *cause* or a "force or pressure" directed at some physical object (Cox & Griffiths, 1995; Kahn & Byosiere, 1992). According to the Law of Elasticity, for example, the demand or "load" placed on a man-made structure would result in "stress" in the affected part of the structure and the interaction between load and stress would lead to "strain" (see Cooper & Dewe, 2004 for a review). The stress threshold, or the idea that demands may be damaging if they are excessive, is also applicable to the physiological or medical perspective of stress (Cox & Griffiths, 1995).

In contrast to the engineering discipline with its focus on non-physical phenomena (i.e., man-made structures), the physiological or medical discipline considered stress in terms of demands placed on people. Stress, according to the medical discipline, is a *response* and may occur when demands overwhelm bodily functions and subsequently have the potential to lead to disease (Abbott, 2001; Cox & Griffiths, 1995). The biological stress threshold of living organisms was termed the 'milieu interieur' in 1859 by Bernard and later referred to as 'homeostasis' by Cannon in 1939 (see Cooper & Dewe, 2004). The notion of the biological stress threshold was related to the discovery of the "stress syndrome", a non-specific physiological response that was found to result irrespective of the type of demand or nocuous agent a living organism was exposed to (Johnson, 1991; Selye, 1936, 1975). In particular, it was the actions of the anterior pituitary-adrenal cortical system and the sympathetic-adrenal

medullary system in response to demands that were the focus of Selye's research, and his research appears to have been influential to the medical discipline's development of the stress concept (Cooper & Dewe, 2004; Cox, Cox, Thirlaway & Mackay, 1985; Cox, Thirlaway, Gotts & Cox, 1983).

Unlike the engineering and medical disciplines, which focused on either the cause or the response aspects of the stress process, the psychological perspective of stress more fully captures the cause-response process, including the influence of the person and the cognitive processing that an individual engages in after exposure to a demand (Cox & Griffiths, 1995; Lazarus, 1966). Thus the focus is on the individual. It is because of this consideration given to the individual that the psychology discipline, in comparison to the engineering and medical disciplines, is said to have reintroduced the "human element" to the study of stress (Cooper & Dewe, 2004). Researchers who subscribed to the psychological perspective of stress recognised that the likelihood of disease developing after exposure to a demand depends on the adaptive capabilities of the person as much as on the nature of the demand itself (Hinkle, 1977). The effect of a particular stressor, for example, can vary according to "conditioning factors" such as age or sex, and these conditioning factors can determine whether the demand leads to stress in the negative sense (i.e., "distress") or perhaps creates a positive stress response or "eustress" (Selye, 1975). In comparison to distress, eustress is a positive stress response because it has the potential to create personal fulfilment or achievement (Kahn & Byosiere, 1992). Although stress may be a positive experience, there is a tendency within the psychology discipline to research issues of ill health, however, a movement toward positive psychology research (i.e., investigating positive states of health) has been advocated to

encourage researchers to consider both illness and "wellness" in future studies (Bakker et al., 2008).

Contemporary stress research is dominated by the psychology discipline's viewpoint on the concept of stress. Presumably, this is because the psychology perspective more fully capturing the stress process due to its recognition of individual perception (Cox & Griffiths, 1995). Although the psychology discipline's definition of stress is perhaps the most comprehensive of the three disciplines, it is apparent that there is substantial overlap between the fields in how they define stress. Most notably, all three disciplines acknowledge that the experience of stress places the item or person in a situation that is potentially challenging to wellbeing. In addition to contributing to how stress is defined, the three disciplines of engineering, medicine and psychology are closely tied to the most widely accepted theoretical approaches to stress research (Kasl, 1978). The theoretical approaches to stress research will be explored in the following section.

2.2 Theoretical Approaches to Stress Research

The most common theoretical approaches to stress research consider stress to be; a stimulus or stressful life event (Holmes & Rahe, 1967; Kahn & Byosiere, 1992); a response or a reaction of the body (Cannon, 1935; Selye, 1936); an interaction between environmental and individual factors (Cooper & Marshall, 1976; Marsella & Snyder, 1981); or a transaction, whereby cognitive processes mediate the relationship between the person and the environment (Lazarus, 1990). The nuances of each theoretical approach to stress will be discussed in this section of the literature review, along with references to the discipline areas they are most

closely related to. In addition to outlining each theoretical approach, the major limitations will also be addressed.

2.2.1 Stimulus Approach

The stimulus approach to stress is perhaps most similar to the definition of stress provided by the engineering discipline, with its focus on the *causes* or antecedents of the stress process (Cox & Griffiths, 1995; Selye, 1956). According to models of the stimulus approach, a person is exposed to a vast amount of information about their environment and they may, consequently, experience strain in the event that the environmental stimuli overwhelms them. The focus of this approach is on the features of the environment.

In the event that the particular stimulus that the person is exposed to has a negative impact, the stimuli can be classified as stress-inducing or a "stressor" (Selye, 1974; Hobfoll, 1989). There are various categories of stressors, they may be a) acute or fleeting, b) stressor sequences (i.e., a succession of demanding situations), c) chronic and irregularly occurring, or d) chronic and constantly present (Elliot & Eisdorfer, 1982). The effect of stressors on health, according to the stimulus approach, varies depending on the nature of the stressor being experienced. Based on this conceptualisation of stress, as being caused by objective or environmental characteristics (Spielberger, 1976), it is possible for researchers to measure the differential effects of various stimuli on individuals' health.

The development of the "life chart" in the early 1900's by Meyer provided the impetus for what is now known as life events research (see Cooper & Dewe, 2004 for a review). Situations that the average person may experience in the course of their life time, coined "life events", were identified based on the study of 5,000 people and were ranked as ranging from

relatively harmless events (i.e., change in sleeping habits, going on vacation) to extremely stressful events, such as death or divorce (Holmes & Rahe, 1967). The magnitude of each of the 43 life events was determined by the level of coping or adjustment participants thought would be required and subsequently, a Life Change Unit (LCU) score was calculated for each life event (Holmes & Masuda, 1974). The ranking of these life events according to their magnitude resulted in the development of a stress scale that can be used to determine the likelihood of illness occurring based on the number and nature of the life events reported to have occurred in the previous year. Scores on the Social Readjustment Rating Scale (SRRS) between 150 and 199 are classified as being at slight risk of poor health, while scores of 200 to 299 suggest moderate risk, and scores greater than 300 indicate high risk of developing a stress related illness or disease (Holmes & Masuda, 1974). Life events research therefore allows researchers to examine the influence of different situations, which vary in intensity, on individual health. It appears that life events may have a cumulative impact, whereby health deteriorates as the frequency and severity of life events encountered increases.

The relevance of the stress threshold, borne out of the engineering discipline and the studying of man-made structures, is linked to the stimulus approach. In the event that environmental demands (i.e., life events) are excessive, the affected area (i.e., the body) is likely to become stressed and "strain" in the form of illness of disease becomes increasingly likely (Cox & Griffiths, 1995). Aside from using the scale to generate a score that indicates general risk of poor health, the scores have also been used to investigate the relationships between life events and particular health outcomes. For example, researchers have studied the associations between critical life events and cardiac related death (Rahe & Lind, 1971), and mental health, as measured by psychological distress and depression (Brown & Harris, 1978;

Higgins & Endler, 1995). The strength of the relationship between objective life events and health outcomes is claimed to be weak however (Lazarus, 1990). Therefore, perhaps further research is required to clarify the impact of life events on specific health outcomes, most notably to determine how they precisely impact on health of an individual.

Stressors are "probabilistic" in nature, it is therefore unlikely that exposure to a stressor will result in exactly the same response or outcome across individuals every time it is encountered (Kanner, Coyne, Schaefer & Lazarus, 1981; Lazarus, 1985). This is perhaps where one of the greatest differences between the engineering discipline and the stimulus approach becomes apparent, because individuals (unlike man-made structures or inanimate objects) are likely to vary in their response. Socio-demographic, cultural, and/or occupational backgrounds, for example, may impact on how individuals respond to life events (Lazarus, 1990; Thoits, 1983). Based on their personal history, particular life events may be perceived as more important to some individuals compared to referent others, and therefore, these individuals may be more negatively impacted on if the life event encountered holds significant meaning (Zegans, 1982). Further, the life events scale does not discriminate between negative life events and positive (i.e., non-stressful) life events and presumes that all identified life events, if experienced, would have a negative impact (Jones & Kinman, 2001; Lazarus, deLongis, Folkman & Gruen, 1985). A life event such as divorce, however, may be perceived as an opportunity for growth and lead to the experience of positive stress (i.e., 'eustress'), rather than 'distress' (Selye, 1982). Therefore, although the stimulus approach considers the impact of environmental antecedents, such as life events, on health it fails to account for individual differences in how the stressful event may be interpreted (Lazarus, 1990). Further, the stimulus approach fails to detail how the body responds to stressors, with focus placed

unduly on the causes of poor health, rather than considering the strain outcome itself. This latter criticism, that the stimulus approach does not consider the strain outcome, is overcome by the response approach to stress, with its focus on physiology.

2.2.2 Response Approach

In comparison to the stimulus approach to stress, with its focus on environmental stressors, the response approach highlights the *effects* (i.e., poor health outcomes) that may result after exposure to a stressful situation. This approach appears to be closely related to the medical discipline, however, the notion of a stress threshold is at the heart of this approach (Cox & Griffiths, 1995). According to the response approach, when the external conditions that an organism is exposed to exceed the organisms physiological ability to adapt, ill health is likely to result (Cannon, 1935). Returning briefly to the bridge analogy mentioned in the previous section, the human stress process can be likened to an extreme load being placed on a bridge, with the load creating stress in the system and leading to strain if it cannot be compensated for. Unlike the stimulus approach, it is not the load that is of importance however, rather, it is the resulting strain that is of significance to the response approach to stress.

This response approach to stress was developed when it became apparent that prolonged exposure to extreme environmental conditions, such as arctic cold or lack of oxygen at high altitudes, required radical changes on the part of the organism that were beyond its adaptive ability and consequently, the organism would not be able to maintain its' steady internal state of "homeostasis", consequently leading to "disaster" (Cannon, 1935). At a similar time to this discovery being made, another researcher found that regardless of the *nature* of the condition that an organism is exposed to (i.e., whether it is physical, emotional

or cognitive), the physiological reaction of the organism is identical, or "non-specific" (Selye, 1936, 1951, 1956) . This non-specific physiological reaction was termed the General Adaptation Syndrome or GAS (Selye, 1956). The basic premise of the GAS is that stress will result if the individual's ability to defend against the stressor is overcome (Selye, 1951; 1974). The GAS reaction pattern was discovered in studies of rats, where it was found that regardless of the type of stimuli the rats were exposed to (i.e., cold, excessive exercise, drugs) they exhibited a similar, non-specific, reaction consisting of three stages (Selye, 1936). The Alarm-Reaction is the first stage of the GAS response and individuals are purported to enter this stage between six and 48 hours following exposure to the stressor (Selye, 1936). During this stage, the individual's numerous bodily defence mechanisms will be activated to cope with the demand (Selye, 1951). For instance, the adrenal glands will produce stress-related hormones called corticoids, and the thymicolympathic apparatus (consisting of the thymus and lymph nodes) is also mobilized (Selye, 1974). The effects of these systems result in numerous changes in the body, including faster breathing, an increase in heart rate and the release of sugar for energy (Cranwell-Ward & Abbey, 2005). All of the effects initiated by these defense mechanisms virtually disappear as the individual enters the Resistance phase, or second stage, of the GAS and the body tries to adapt to the demands and regain homeostasis (Selye, 1936; 1951; 1956). During this period of resistance, it is possible to perform at a high level and feelings of fatigue tend to go unrecognized due to the release of epinephrine (Cranwell-Ward & Abbey, 2005). However, in the event that the individual is exposed to the demand for an extended period of time and/or the demand is intense, the body's ability to adapt is impeded and individuals may enter the third stage of the GAS process, Exhaustion (Selye, 1936). During the third stage, the defence mechanisms that were initially activated during the Alarm-

Reaction phase are reactivated (Selye, 1936; 1974). However, unlike the first stage, the effects of the defence mechanisms on the body during the third stage become irreversible and similar to a machine, the body's ability to adapt to the demand is eventually worn down and exhaustion ensues (Selye, 1974). This stage is also known as burnout and individuals who reach this final stage of the GAS process may experience a variety of health problems, also known as "diseases of adaptation" (Selye, 1951, p.337; Cranwell-Ward & Abbey, 2005). Based on the notions underpinning homeostasis and the GAS, stress is therefore defined by the response approach as being an outcome that is largely identical for all individuals due to being a product of the nervous system and endocrine system (Selye, 1951).

A major limitation of the response approach to stress is the lack of attention paid to the diversity of individuals. The same event is not likely to trigger an identical response from all persons, as proposed by the GAS (Selye, 1936), because responses to stimuli are subjective and unique (Mason, 1971; Lazarus, 1990). In addition to not accounting for inter-individual differences, the response based approach also fails to acknowledge intra-individual variations. In particular, the response of an individual person is not likely to be identical for all situations they experience and it is instead likely that a person's response will vary depending on the exact situation being faced at the time. More specifically, the physiological activity of the nervous and endocrine systems may not react in an identical manner for all sources of stress, as proposed by the GAS model (Selye, 1951), because the actions of these systems appear to depend on the nature of the stressor and whether the stressor requires the individual to respond through physical or psychological effort (Cox, Cox, Thirlaway, & Mackay, 1985; Dimsdale & Moss, 1980). Therefore, the nature of the stressor needs to be considered, as the exact type of defence mechanisms activated will vary according to the source. In summary, the response

approach focuses on non-specific physiological reactions to stressors, similar to the stimulus approach however, the response approach only partially explains an individual's reactions to a stressful event (Bicknell & Liefooghe, 2010). Although both the stimulus and response approaches to stress are claimed to have provided researchers with a solid research foundation, neither approach fully captures the stressor-strain relationship, as they each focus on one part of the stress process, either the antecedent or the outcome (Cooper & Dewe, 2004). In comparison to the stimulus and response approaches, the definitions of stress that have evolved out of the psychology discipline are perhaps more comprehensive.

2.2.3 Interactional Approach

The psychology discipline has provided two approaches to stress, commonly known as the interactional and the transactional approaches (Cox & Griffiths, 1995). The psychological approaches to stress are perhaps more comprehensive than the response or stimulus approaches to stress, mainly because they consider the individual factors that may influence the stress process.

According to the interactional approach, stress is judged to be dynamic in nature and dependent on the interaction between the environment and the individual (Cox & Griffiths, 1995; Kahn & Byosiere, 1992). The interactional approach claims that individual, situational or other variables may moderate the stressor-strain relationship (Cooper & Dewe, 2004). Therefore, rather than assuming a lineal relationship between demands and outcomes, for example that arctic cold or a critical life event will directly result in poor health (Holmes & Rahe, 1967; Selye, 1936), the interactional approach is bi-directional in nature. The interactional model has also been known as the ecological or biosocial model, and researchers

have used the philosophy of the interactional approach to more fully understand bi-directional relationships between the environment, the person and stress-related outcomes such as schizophrenia, mental ill health and coronary heart disease (Cooper & Marshall, 1976). The Social Environment Model (SEM) of stress is an example of a model that falls within the interactional approach. This particular model captures aspects of the objective environment, the moderating effects of individual qualities (i.e., demographic and personality characteristics) and the consequences of these factors on the individual (Buunk, de Jong, Ybema, & de Wolff, 1998) An advantage of interactional models, such as the SEM, is that they are bi-directional and recognise that outcomes of the stress process may feed back into the model and themselves become an antecedent of the stress process (Buunk, et al., 1998).

The major strength of models that subscribe to the interactional approach however, is the attention paid to individual differences. This broadening of focus in comparison to other approaches may have come at a cost however, as it has been suggested that models that prescribe to the interactional approach to stress are not particularly precise in regards to specifying antecedents or outcomes. It has been claimed, for example, that models that fall within this classification tend to encapsulate a broad range of predictor variables that may or may not be relevant and stress reactions are "lumped together", with both of these limitations making the model empirically difficult to evaluate (Buunk, et al., 1998). Lack of specificity is perhaps one of the reasons why researchers dismissed the value of the interactional approach rather quickly (Cooper & Dewe, 2004) perhaps in favour of the newer transactional approach to stress.

2.2.4 Transactional Approach

Both the interactional approach to stress and the transactional approach to stress are claimed to be based in the psychology discipline (Cox & Griffiths, 1995). The transactional approach to stress is perhaps unique however, in that it centres on individual cognition, an issue which is not considered by any of the other approaches. According to the transactional approach, stress is likely to be experienced if individuals cognitively appraise the environment as harmful or threatening to them, and if they perceive that their coping resources are inadequate to successfully deal with the situation (Lazarus, 1990). In simple terms, it is the mismatch or misfit between the demands of the situation and the resources available to the individual that lead to the experience of stress (Cooper & Dewe, 2004). The individual determines whether there is a mismatch between the demands being encountered and their resources through cognitive appraisal. Cognitive appraisal is defined as being a process that individuals engage in to evaluate the personal meaning or relevance of situations they encounter (Holroyd & Lazarus, 1982). It is through cognitive appraisal that the person is linked to the encounter (Lazarus, 1966). The first type of appraisal an individual is believed to engage in is called primary appraisal, which is carried out to determine the significance of the situation they are being faced with, whether it is harmful or threatening to the individual in some way, or whether it is "benign-positive" (Lazarus & Folkman, 1984). In the event that the situation is identified as having the potential to harm the individual, a second type of cognitive appraisal, known as secondary appraisal is said to occur (Folkman, Schaefer, & Lazarus, 1980). The purpose of secondary appraisal is to evaluate whether the coping resources that are available to the individual are likely to be sufficient given the initial or "primary" appraisal of the situation (Lazarus & Folkman, 1984). In general terms, stress may result, according to this

approach, if the individual does not perceive a match between the situation at hand and their coping resources. More specifically, situations are more likely to be perceived as 'stressful' if they (a) present demands to the individual that exceed their coping resources, (b) constrain the individual and provide them with little control to cope with demands, and (c) isolate the individual and offer limited social support (Cox & Griffiths, 1995). Therefore, according to the transactional approach to stress research, cognitively evaluating ones environmental demands, constraints and resources, may lead to the experience of "stress" if the resources are deemed to not be sufficient to cope with the demands of the situation.

In summary, the transactional approach to stress is perhaps advantageous compared to alternative approaches because it considers the whole stress process (i.e., stressors and response, or antecedents and outcomes), as well as acknowledging the individual in the form of cognitive appraisal and perhaps most importantly, transactional approaches recognise the importance of resources to the stress process. In view of these strengths, a number of models of stress that prescribe to the transactional approach have been created, known as transactional models of stress.

2.3 Transactional Models of Stress

There are a number of transactional models of stress within the academic literature, each of them viewing individual health as being determined by both the stressors encountered by the individual and the availability of appropriate resources. Due to the importance placed on resources, transactional models of stress paint a contrast to other models of stress that tend to focus on the impact of stressors only, such as those that subscribe to the stimulus paradigm.

Prior to discussing particular transactional models of stress, a transactional theory as to how resources are implicated in the stress process will first be discussed.

According to the Conservation of Resources (COR) theory, it is not the demands an individual is exposed to *per se* that may lead to the experience of stress, rather, it is the resources that are the key as to whether stress occurs (Hobfoll, 1989). Based on an investigation of the literature, resources appear to have the potential to buffer against the negative effects of stressors, depending on whether they are appropriate for the type of stressor being encountered. Resources may take the form of objects, conditions, personal characteristics and/or energies (Hobfoll, 1989). *Object resources* are valuable because of their physical nature and/or the status associated with them (i.e., ones house), *personal characteristic resources* are any resource with the capacity to increase resistance to stress (i.e., social support), *condition resources* are sought by most people and are valued (i.e., marriage), and finally, *energy resources* are resources that enable the acquisition of further resources and such enabling resources include time and money (Hobfoll, 1989). Although resources may appear to be individually determined based on these classifications, resources are claimed to be culturally and trans-culturally derived (Hobfoll, 2001). In the workplace, for example, whether a resource such as social support is available to individuals may depend on the culture of the organization and whether the culture generally lends itself to people being supportive of others.

All resources, regardless of their classification, appear to be similar in that they have the capacity to promote health, provided that they are successfully managed and are available when required (Hobfoll, 2001). In other words, if an appropriate resource is available to a person to deal with the stressor being faced, they are less likely to experience a stress response

as a result. In the event however that (a) resources are threatened, (b) resources are lost, or (c) unable to be regained after resource loss, individuals are likely to experience stress according to the COR theory (Hobfoll, 1989). The event of resource loss is purported to have a stronger (negative) impact on individuals than the (positive) impact that acquisition of additional resources can have on individuals (Hobfoll, 2001). The reason for this may be due to an innate or learned tendency to give greater weighting to negative information over positive information (Cacioppo & Gardner, 1999; Ito, Larsen, Smith & Cacioppo, 1998). In addition, resource loss may be considered as more important than resource gain because losses tend to have an effect on the group to which one belongs, in addition to affecting oneself (Westman & Etzion, 1995). Based on these arguments, the negative experience of resource loss may perhaps be more likely to impact on health than the positive experience of resource gain, and researchers have found support for this in terms of emotional distress (Hobfoll & Lilly, 1993). Another proposition put forth by the developer of the COR theory is that individuals need to invest in their resources in order to protect against resource loss, to recover more easily from resource loss, and to gain resources, because individuals with a greater number of resources are less likely to be negatively impacted on (Hobfoll, 2001). In comparison, individuals with fewer resources are more likely to suffer from resource loss and once resource loss occurs, it is probable that it will occur again (Hobfoll, 1998; 1999).

It appears that similar to stressors, resources have the potential to result in strain (Leiter & Maslach, 1988). Generally, however, resources are perceived as health-protecting. Transactional models of stress, such as the Job Demands-Resources (JDR) model, which applies COR theory to an organisational context, contend that the likelihood of a stress

response eventuating after exposure to stressors is minimized if resources are available to employees (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

2.3.1 The Job Demands Resources (JDR) Model

The JDR model was developed to allow researchers to investigate the impact of job-related demands (i.e., stressors) as well as resources on employee health outcomes (Demerouti, et al., 2001). The most commonly used measure of job demand in the literature is workload, which generally refers to the work that is required of the individual in question (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). The job-related demands included in the JDR model are workload, time pressure, shift work, recipient contact and physical environment, while the resources included in the model are organisational feedback, rewards, participation, job security, job control and supervisor support. Initial research investigating the impact of JDR variables on health found that high levels of job demands and low levels of resources were each associated with poor employee health in the form of burnout (Demerouti, et al., 2001). Together these results suggest that people who are employed in either demanding jobs, or jobs where they have insufficient resources available to them, are susceptible to experiencing outcomes associated with poor health. In addition to the singular effects of job demands and resources, it has been acknowledged that it is important to consider the interaction between levels of job demands and levels of resources and the potential impact they may jointly have on health (Demerouti, et al., 2001). That is, the likelihood of job demands resulting in a stress response may depend on the abilities of the particular person and other resources, because if they are an appropriate match for the stressor then a stress response may be avoided (Cox & Griffiths, 1995; Hobfoll, 1989).

In contrast to the JDR model, which tends to focus on the separate influences of job demands and resources, there are alternative (although similar), transactional models of stress that consider both the singular effects and the interaction effects of job demands and resources. One particular transactional model of stress, known as the Demand Control Support (DCS) model (Karasek & Theorell, 1990), perhaps best captures the most commonly used measures of job demands and resources. Discussion will now turn to more fully exploring the DCS model, a transactional model of stress that is perhaps more precise than the JDR model due to the narrower range of variables considered.

2.3.2 The Demand Control Support (DCS) Model

The DCS model was originally a two-dimensional model consisting of job demand and job control (i.e., the 'DC' model) but was later expanded to include social support (i.e., the 'DCS' model) due to the health-promoting ability of social support and its potential to lessen the risk of cardiovascular disease particularly (Johnson & Hall, 1988; Johnson et al., 1989; Karasek, 1979; Karasek & Theorell, 1990). The DCS model, similar to the JDR model, captures both stressors and resources. More specifically, the stressful aspect of an individuals' job are captured by the job demands component of the DCS model, whereas resources are encapsulated by the job control and social support components of the model.

The DCS model is one of the most widely-used conceptual frameworks underpinning occupational stress research, and it has been found to have strong predictive capacity in a variety of occupational and industrial contexts (de Lange, et al., 2003; van der Doef & Maes, 1999). Although researchers typically study a homogenous group of employees (i.e., one job category) in their individual research projects (Kompier, 2003), the DCS model has been

confirmed as statistically valid based on studies of individuals from a diverse range of occupations (de Lange, et al., 2003). In particular, cross-occupational relevance has been demonstrated with employees from the nursing, banking and carpentry industries (Karasek, 1979; Karasek et al., 1981; Karasek & Theorell, 1990).

According to the DCS model, individuals are at increased risk of experiencing psychological strain if the level of demands they encounter exceeds their level of available resources (Karasek, 1979; Karasek & Theorell, 1990; R. L. Lazarus, 1999). More specifically, psychological stress reactions are likely to result if one's job is characterised by high work-related demands, few opportunities for control or autonomy, and/or insufficient social support (Karasek, 1979; Karasek & Theorell, 1990). This "high strain" situation (high demands coupled with few resources) appears to be the most noxious in terms of employee health and it has been linked to a number of physical and mental health outcomes including elevated blood pressure, cardiovascular disease, exhaustion, depression and anxiety (Karasek, 1979; Schnall, Landisbergis, & Baker, 1994; Schwartz, Pickering, & Landisbergis, 1996; van der Doef & Maes, 1999). In contrast, "low strain" jobs that are characterised by a combination of low demands and high control and/or social support are likely to lead to relatively few health problems in comparison (Karasek, 1979; Karasek & Theorell, 1990). The high strain situation (i.e., high job demands, low job control and low social support) is the main focus of this thesis.

The underlying premise of the DCS model is that the joint or "multiplicative" effects of demand, control and/or support determine the likelihood of psychological strain and associated health problems (Karasek, 1979). High strain situations are proposed to have the most adverse effects on mental health, while low strain situations are regarded as being

unlikely to have a noxious effect (Karasek & Theorell, 1990). However, reviews of empirical DCS research indicate that main or direct effects of each of the DCS components onto health are more likely to be supported, while evidence for interaction effects tends to be inconsistent (de Lange, et al., 2003; van der Doef & Maes, 1999). In order to fully understand each component of the DCS model, the relationships between each job characteristic and various health outcomes will be examined in turn. Following the discussion of main effects, the potential for curvilinear effects and interaction effects in terms of the DCS variables will be considered.

2.3.2.1 Job Demand

Job demands are one of the major aspects of work design that have the potential to impact on employee health (Parker, Turner, & Griffin, 2003). In particular, it appears that time pressures, monitoring demands and problem solving demands or level of cognition required are the most likely types of work-related demands to negatively impact on employee health (Beehr, Glaser, Canali, & Wallwey, 2001; Karasek, 1979). Job demands can be quantitative, including a great amount of work in a short period of time or a consistently heavy workload, or qualitative, whereby the individual is faced with role ambiguity or role conflict (Janssen, 2001). The impact of job demands on health appears to be cross-cultural, with researchers finding that the relationship between high job demands and poor health exists across different ethnic backgrounds (Gutierres, Sanenz, & Green, 1994). Researchers have found that individuals with increased qualitative and/or quantitative job demands are two to three times more likely than their counterparts to experience a range of physical and psychological health problems, including eye, ear and skin problems, back, head and stomach ache, respiratory difficulties,

insomnia, irritability and anxiety (Karasek & Theorell, 1990; Schultz, Wang, & Olson, 2009). In addition to leading directly to poor health outcomes, job demands may also indirectly lead to the development of musculoskeletal problems through mental health (Elovainio & Sinervo, 1997). A recent meta-analysis of high quality DCS studies with individuals from a range of occupations found that high job demands were associated with psychological health outcomes including emotional exhaustion, psychological wellbeing, psychological distress, depression and job dissatisfaction (de Lange, et al., 2003). It has been suggested that physical and psychological stress reactions in response to high levels of job demands are not inevitable, although stress and poor health is likely to result if the activation of mental effort is excessive or persists for longer than is required for the task (Gaillard & Wientijes, 1994).

Inspection of empirical DCS research indicates that researchers tend to use a global measure of job demand to explore the relationship between demands and health (e.g., Jeurissen & Nyklicek, 2001; Noblet, Rodwell, & McWilliams, 2006). In comparison, some researchers have investigated links between specific types of job demands and health outcomes. For instance, in one study that used a disaggregate measure of job demands, both time pressures and problem-solving demands were found to be significantly related to psychological strain, whereas the third type of job demand, monitoring demands, was not significantly related to psychological strain (Beehr, et al., 2001). In a similar study, researchers found that problem-solving demands were a significant predictor of occupational stress for employees who reported having high levels of 'job demand', although time pressures were not a significant predictor for this group (Schultz, et al., 2009). Therefore, the results of these studies that have used a disaggregate measure of job demand indicate that not all types of job demands are necessarily linked to occupational stress for individuals employed

in high strain jobs. The latter study also compared the significant predictors of occupational stress for the role overload group to two other groups, a matched group (i.e., balance between job demands and skill) and a role under load group (i.e., too few job demands compared to skill level). For the matched group, both the problem-solving demand and time demand were significant predictors of stress, while time pressures were the only job demand significantly related to occupational stress for the role under load group (Schultz, et al., 2009). There are two important implications of these results. First, some but not all types of job demand may demonstrate a significant association with job strain and second, having too few demands may also result in job strain (Schultz, et al., 2009). Although there is evidence to suggest that insufficient job demands can lead to poor health, monotony and feelings of isolation, the focus within the occupational stress literature tends to be on the negative effects of high levels of job demands on health (Edwards, 1991; Gaillard, 1993).

2.3.2.2 Job Control

Job control, also known as 'decision latitude' is the second component of the DCS model (Karasek & Theorell, 1990). It is generally accepted within the literature that job control consists of two dimensions; 'decision authority' and 'skill discretion' (Hausser, et al., 2010; Karasek, 1979; van der Doef & Maes, 1999). Decision authority refers to the degree of freedom employees are afforded to make decisions about how they do their work (i.e., ability to alter ones' working procedures or schedules), and skill discretion refers to the extent that a variety of skills can be employed while undertaking work tasks (Jones & Fletcher, 2003; Karasek & Theorell, 1990). Job control can also be defined as the degree of power or mastery an individual has over their work environment (Fisher, 1985). It appears that the level of job

control an employee has may be a product of the particular organisation. For instance, lines of authority, tight monitoring, rigid policies and/or poorly defined jobs can determine the decision making power given to individual employees (Karasek, 1979). In addition, the employment sector an individual is engaged in and their status or rank within the organisation may also determine their level of job control. For example, blue collar workers or those who carry out essential manual and monitoring tasks within service and production-focused organisations, are likely to have less job control than individuals employed in office, managerial or professional roles (Fisher, 1985). Further, research indicates that more highly educated individuals, full-time permanent employees and public sector employees have consistently higher levels of job control than their counterparts (Gallie, Felstead, & Green, 2004). In addition to the distinct differences in job control at both the group and individual level, the authors of the latter longitudinal study also demonstrated that in Britain between 1992 and 2001 the level of job control afforded to employees declined, and this result was consistent across all demographic breakdowns including employment sector, occupation and qualification level, employment status (i.e., full-time, part-time, permanent, temporary) and age (Gallie, et al., 2004). Widespread declines in job control may have a far-reaching adverse affect on health outcomes, particularly considering that high levels of job control are preferable to diminished job control (de Lange, et al., 2003; van der Doef & Maes, 1999).

The negative effects of low levels of job control on health appear to be cross-cultural. One multinational study found low job control to be associated with psychological strain in all seven countries under investigation (Bhagat, et al., 1994). Low levels of job control have been directly linked to an increased risk of heart disease, alcohol-related problems, burnout, job dissatisfaction, psychological distress, depression, and depression in one's spouse (Barnett &

Brennan, 1997; Bourbonnais, Comeau, & Vezina, 1999; Bromet, Dew, Parkinson, & Schulberg, 1988; J. de Jonge, Le Blanc, Schaufeli, & van der Linden, 1998; Johnson, et al., 1995; Mausner-Dorsch & Eaton, 2000; Muntaner, Tien, Eaton, & Garrison, 1991; Stets, 1995). Employees with low levels of job control may also be more prone to apathy, passivity, feelings of helplessness, and have few aspirations (Parker, et al., 2003). In contrast, high levels of job control have been found to be associated with the use of proactive problem-solving, increased intellectual flexibility and they support a self-directed approach (Jackson, 1989; Kohn & Schooler, 1982). Although high levels of job control are preferable to low levels of job control, a review of the DCS literature indicates that whether high levels of job control are beneficial to an individual may depend on their personality characteristics, such as whether they exhibit Type A behaviour (van der Doef & Maes, 1999). The relationship between levels of job control and health appear to be strong however, with both subjectively and objectively assessed job control related to prospective illness, particularly coronary heart disease (Bosma, et al., 1997).

2.3.2.3 Social Support

The original two-dimensional DC model (i.e., consisting of job demand and job control) was expanded approximately a decade after its development to include social support (Karasek, 1979; Karasek & Theorell, 1990). Social support has been defined as an interpersonal transaction that may involve providing emotional support (i.e., being empathetic and/or loving), informational support (i.e., providing information or advice on where to obtain information which may assist the individual), instrumental support (i.e., providing goods or services that directly assist the individual), and/or appraisal support (House, 1981). Each type

of social support is highly correlated (House & Kahn, 1985). However, there is evidence to suggest that the effects of each type of social support onto health may differ (Cohen & Wills, 1985). One type of social support may be more useful given the particular situation, with research suggesting that social support is more effective when the type is matched appropriately to the stressor being experienced (Cutrona, 1990; Hobfoll, 2002; Sarason, Sarason, & Pierce, 1990). Due to the limited number of studies that have included the various types of social support however, it is unclear how each type of social support (i.e., emotional, instrumental and informational support) influences employee outcomes (Halbesleben, 2006). Future research studies that utilise a disaggregate measure of social support may provide clarity as to the effectiveness of particular types of social support. In addition, disaggregate measures of social support may allow researchers to compare the effectiveness of social support depending on the source, or who it is being provided by.

Social support may be provided to individuals from a variety of sources, including colleagues, supervisor, friends or family members (Halbesleben, 2006). Social support from work-related sources may include "support from co workers" or "understanding from my employer/boss", while non-work related sources of social support may include "help with tasks at home" or "good relationship with my children" (Hobfoll, 1988). Within the occupational stress literature, researchers have tended in the past to include only one source of social support, such as work-based (e.g., Elovainio et al 2002; Kivimaki et al 2003) or non-work based (e.g., Liukkonen et al., 2004) making it difficult to compare the effects of different sources. However, both work-based support (Akerboom & Maes, 2006; Noblet et al., 2006) and support provided from outside the workplace (Munro et al., 1998) have each been found to be important in terms of employee health. In order to fully understanding how social

support impacts on employee outcomes, measures of social support that include multiple types (i.e., emotional, instrumental and appraisal) and multiple sources of social support (i.e., supervisors, colleagues, family and friends) are preferable to global measures of social support (Etzion & Westman, 1994).

Considering the relatively late addition of social support to the DCS model, the extent to which social support impacts on health has been relatively unknown until recent years (Hausser, et al., 2010). Nevertheless, it is generally accepted within the literature that receiving high levels of social support appears to be favourable in terms of health outcomes. Empirical research has demonstrated that high levels of social support can reduce the likelihood of physical health problems (Gutierres, et al., 1994) and improve psychological health through reduced irritation and fewer incidences of anxiety and depression (Kahn & Byosiere, 1992; Winnubst, Marcelissen, & Kleber, 1982), for example. Conversely, according to the *chronic strain hypothesis*, low levels of social support are likely to have a negative influence on health outcomes (Dohrenwend & Dohrenwend, 1981) and links have been found between low levels of social support and poor mental health outcomes including emotional exhaustion (Jan. de Jonge, Reuvers, Houtman, Bongers, & Kompier, 2000) and depression (Chen, Siu, Lu, Cooper, & Phillips, 2009).

High levels of social support may act as a buffer against poor health by providing the recipient with a resource to cope when they are faced with a stressful situation (Buunk, 1990; Cohen & Wills, 1985). This moderating capacity of social support is called the *stress-buffering effect* (Schwarzer & Knoll, 2007). High levels of objective social support have been demonstrated to moderate the effect of work-related stressors on depression (Chen, et al., 2009), thereby backing the notion that social support has the potential to act as a buffer. This

finding indicates that the relationship between work-related stressors and depression may be ameliorated in the event that adequate social support is provided to the individual in the stressful situation. Further, it appears based on a review of the literature by Chen and colleagues (2009), that social support may be both indirectly related to health outcomes (i.e., through moderation) as well as being directly related to health outcomes.

Much of the evidence for the social support-mental health relationship has tended to come from cross-sectional studies (Hausser, et al., 2010; van der Doef & Maes, 1999). However, the beneficial influence of high levels of social support on health may persist across time. In one study, support provided by a friend, partner, or supervisor was significantly related to decreased psychiatric morbidity 3 years later (Vaananen, Vahtera, Pentti, & Kivimaki, 2005). Similarly, high levels of social support, in another study, were found to be related to fewer depressive symptoms at 5 year follow-up (Heponiemi, et al., 2006). In combination, the results of these prospective studies indicate that the beneficial effects of social support may persist for at least a few years for some mental health indicators.

Both work-based support (Akerboom & Maes, 2006; Noblet et al., 2006) and support provided from outside the workplace (Munro et al., 1998) have been found to have the potential to positively impact on employee health. However, there is inconsistency within the literature as to whether work-based or non-work based social support is superior in terms of health (Love, Irani, Standing, & Themistocleous, 2007). A review of the social support literature suggests that the effectiveness of work-based or non-work based social support may depend on the nature of the problem at hand. Individuals who are facing work-related problems for instance, will probably more effectively deal with the stressor if they are provided with social support from others within their work environment (i.e., work-based

support) through supervisors or colleagues, rather than support provided from non-work based sources (House & Kahn, 1985). The reason work-based support is more likely to be effective when an individual encounters a problem in the workplace has been suggested to be because colleagues can provide physical aid (i.e., directly reducing demands) to the individual, while support from friends and family members may be limited to sympathy about the situation (Halbesleben, 2006). Although work-based support may be more effective in terms of work-related demands, however, the effectiveness of such work-based social support may differ according to who in the workplace is providing it. To demonstrate, support provided by supervisors was found in one study to be significantly related to job satisfaction, whereas support from colleagues in the same study was not significantly related to job satisfaction (Amick & Celentano, 1991). The authority or influence of the supervisor's position, in contrast to the level of authority of the worker's peers may account for why supervisor support was significantly related to job satisfaction while colleague support was not.

In addition to the effectiveness social support depending on the whether the stressful situation occurs within the workplace or not, effectiveness may also depend on whether or not the support is provided to the individual at the same time as the stressful situation they are facing. Co-worker support for example, has been related to improved mental health, but only when the social support and mental health data were obtained at the same time, at baseline (Vaananen, et al., 2005). The same study found support from a friend was significantly related to mental health only when friend support was measured at baseline and mental health was measured later, at follow-up. In light of these findings, measures of social support that includes multiple sources (i.e., supervisors, colleagues, family and friends) are perhaps preferable (Etzion & Westman, 1994) and the use of such instruments in studies that measure

dependent variables at both baseline and follow-up may help to clarify how social support is related to health outcomes.

Even though high levels of social support generally have a positive influence on health, there is evidence to suggest that it also has the potential to have a negative impact on health. Social support provided to an individual from within their workplace, for example, has the potential to adversely impact the employees' health if it a) draws increased attention to an employees' already stressful work situation, b) threatens an employee's self-image by making them feel inadequate or c) if the social support being received by the employee is unwelcome (Beehr, Bowling, & Bennett, 2010). This finding runs in contrast to the majority of social support research, because it indicates that high levels of social support may not necessarily yield a favourable outcome. Further, this finding casts doubt over whether high levels of social support are always directly related to a proportionate increase in health.

2.3.2.4 Non-linear or Curvilinear Effects of the DCS Model

Many studies based on the DCS model have tended to only consider the relationships between work characteristics and indices of job stress as linear and have therefore restricted their studies to the investigation of direct or main effects (van der Doef & Maes, 1999). Although it is well established that an increase in a work characteristic, such as job demand, tends to be associated with a decrease in health, poor health may also occur when job demands are too few, such as when there is too little stimulation (Kahn & Byosiere, 1992). Although studies of DCS curvilinearity are relatively few, there is support for the existence of curvilinear relationships, where an undersupply or oversupply of the characteristic in question can have a deleterious impact on health (De Jonge et al., 2000, Xie and Johns, 1995). One particular

study, for example, found that insufficient, as well as excess, amounts of job related work characteristics, including job demand, role ambiguity and overtime, were each related to poor employee health in the form of strain (French, Caplan, & Harrison, 1982). The existence of non-linear or curvilinear relationships between work characteristics and health outcomes can be explained in terms of the Vitamin Model.

The Vitamin Model uses vitamins as an analogy for explaining the non-linear relationship between work characteristics and health (Warr, 1987). According to the model, insufficient levels of vitamins are related to bodily impairment and poor health, however, with an increase in vitamin intake individual health improves, but only up until a point where the effect on health appears to plateau. Once this plateau is reached, continued consumption of vitamins is likely to bring the level of health down again beyond its optimal level, until eventually, continued use of the vitamins are likely to have a negative effect and impair health (Warr, 1987). This curvilinear relationship is best represented by a U-shaped curve. A number of researchers have utilised the vitamin model to study associations between work characteristics and health, finding significant relationships between job demands and job satisfaction (J. de Jonge, Schaufeli, & Furda, 1995; Warr, 1990), job control and job satisfaction, job control and emotional exhaustion (Fletcher & Jones, 1993; Warr, 1990), social support and job satisfaction, social support and emotional exhaustion, and social support and reduced personal accomplishment (J. de Jonge, et al., 1998; J. de Jonge, et al., 1995). The results of these studies suggest that optimal employee health is achieved when the level of work characteristic (i.e., job demand, job control, social support) is moderate. There is evidence to suggest that too little interaction or too much interaction with others (i.e., deprivation or excess of social support) for example, may negatively impact on health and that

moderate levels of social support are preferable (Buunk, Doosje, Jans, & Hopstaken, 1993; Kahn & Byosiere, 1992). Therefore, the assumption that high levels of work characteristics, such as social support, will directly lead to an improvement in health outcomes (i.e., a main effect) needs to be challenged by researchers. The inclusion of curvilinear terms in work stress research studies is claimed to increase the external validity of research and researchers should therefore, ideally, investigate the impact of antecedents individually as well as in combination with each other (Kahn & Byosiere, 1992). Studying work characteristics in combination with each other is perhaps logical considering that employees are likely to encounter many different situations and stressors at work and it is unlikely each experience will occur in isolation. In addition to being important in their own right, it is empirically important to consider curvilinear terms, because if they are not included then any significant interaction effects may incorrectly suggest the existence of an offsetting (i.e., interaction) relationship that does not exist (Fletcher & Jones, 1993; Ganzach, 1997).

2.3.2.5 Interaction Effects and the DCS Model

An interaction effect refers to "when the impact of one independent variable on the dependent variable depends on the level of another independent variable" (Ganzach, 1997, p. 235). An interaction effect may also be referred to within the literature as a multiplicative effect (Hausser, et al., 2010). Interaction or multiplicative effects consist of multiple variables, such as two variables (i.e., two-way interaction effect) or three variables (i.e., three-way interaction effect). The number of variables included in interaction terms may depend on the particular model chosen for a research project. Empirical studies based on the original two-dimensional DC model, for instance, are limited to two-way interaction effects between job demand and

job control, whereas research projects that utilise the expanded DCS model allows investigation of two-way and/or three-way interaction effects (Karasek, 1979; Karasek & Theorell, 1990).

The two-way interaction effect between job demand and job control (i.e., D x C) appears to be the most commonly studied interaction effect within the job strain literature. Supportive results for the D x C interaction indicate that the usual negative effects of high job demands on health are attenuated or buffered by high levels of job control (van der Doef & Maes, 1999). The D x C buffering effect has been demonstrated for a number of mental health outcomes, including psychological distress (Bourbonnais, et al., 1999), job satisfaction (de Witte, Verhofstadt, & Omey 2007), emotional exhaustion (Salanova, Piero, & Schaufeli, 2002), and depression (Mausner-Dorsch & Eaton, 2000). In combination, these findings suggest that high levels of job control have the potential to ameliorate the adverse impact of job demands on mental health outcomes. Empirical support for the D x C interaction effect on general mental health outcomes has been found in 39% and 48% of recent DCS meta-analyses, respectively, for research carried out between 1979-1997, and 1998-2007 (Hausser, et al., 2010; van der Doef & Maes, 1999). It has been suggested that in order to claim a genuine D x C interaction effect exists however, that curvilinearity, as discussed in the previous section, needs to be accounted for. The addition of curvilinear terms has seen an apparently significant two-way interaction effect become non-significant (Fletcher & Jones, 1993). Nevertheless, there is a large body of evidence in support of genuine D x C interactions (see Hausser, et al., 2010; van der Doef & Maes, 1999).

The two-way D x C interaction term appears to be included in empirical studies rather regularly. However, based upon the a priori predictions of the DCS model, there is reason to

suggest that two-way interaction effects may exist between other components of the DCS model, not just job demand and job control. The multiplicative effects of the DCS model were depicted in Figure 1 and demonstrated that job demands may also interact with social support, or that job control may also interact with social support, for example. Few researchers appear to have investigated two-way interaction effects between components other than job demand and control. One longitudinal study that tested for the effects of various two-way DCS terms on psychological distress and job satisfaction did not result in any significant interaction effects (Johnson et al., 1995). It is unclear whether the researchers controlled for curvilinear effects of the DCS variables prior to the inclusion of interaction terms in their data analyses and whether or not omitting curvilinear terms had an impact on the probability of the interactions being significant. Considering the premise of the DCS model, rather than focusing purely on the two-way D x C interaction, other two-way multiplicative terms will be adopted in this study in order to determine whether they are significantly related to the mental health outcomes under investigation.

The addition of social support to the original DC model has meant that the definition of a "high strain" job has evolved to include low levels of social support and the addition has allowed for the creation of a three-way interaction term between job demand, job control and social support (Karasek, 1979; Karasek & Theorell, 1990). Although the likelihood of the three way D x C x S interaction being significant is slightly lower than any of the two-way interactions (i.e., 21-40% compared to 39-48%), empirical support has been found for the three-way interaction in terms of a number of outcome variables (Hausser, et al., 2010). Significant associations have been found between the D x C x S interaction and outcomes including psychological distress (Akerboom & Maes, 2006), job satisfaction (Pascual, Perez-

Jover, Mirambell, Ivanez, & Terol, 2003; Verhoeven, Kraaij, Joekes, & Maes, 2003) and emotional exhaustion (Verhoeven, et al., 2003) with these findings indicating that social support and job control have buffered what would otherwise be a negative effect of job demands. Support for the three way D x C x S interaction effect tends to be cross-sectional in nature (van der Doef & Maes, 1999). However, the three-way D x C x S interaction has also been linked to prospective health, in the form of psychosomatic complaints, in both homogenous and heterogeneous samples (Parkes, Mendham, & Rabenau, 1994). The existence of significant DC/S interaction effects has practical implications in terms of workplace health promotion strategies. In studies where there is evidence for a relationship between a DC/S interaction effect and a mental health outcome, job control and/or social support may need to be increased in order to protect employee health from the adverse effects of job demands (Hausser, et al., 2010).

2.3.2.6 Summary

In summary, the DCS model is regarded as one of the most influential transactional models of stress within the literature and the components of the DCS model have been associated with health outcomes in a vast number of studies across industries and occupations (see de Lange, et al., 2003; Hausser, et al., 2010; van der Doef & Maes, 1999). The basic premise of the model is that individuals employed in "high strain" jobs characterised by high job demands, few opportunities for control, and/or insufficient social support are likely to experience poor general health and job-related health (Karasek, 1979; Karasek & Theorell, 1990). In other words, employees are more likely to experience poor health if resources, such as job control and social support, are not available to them to cope with stressors including job demands.

However, the capacity for job control and social support to protect employee health in the long-term may be limited, with a review of high quality longitudinal studies demonstrating that the effect of job demand, rather than job control or social support, tended to be sustained in studies over periods of one year or longer (de Lange, et al., 2003). In addition to perhaps being limited temporally, the DCS model has been criticised for not considering the importance of the organisational influences. Although work characteristics remain relevant in the modern day, the context that work occurs within needs to be considered as well (Parker, Wall, & Corderey, 2001). Researchers have consequently begun the search to expand the set of commonly studied resources, from job control and social support, to include other key resources that may have the potential to influence employee health in the longer-term. One such resource that stress researchers have begun to incorporate into studies using components of the DCS model is organisational justice.

2.4 Organisational Justice

The term 'organisational justice' is used to describe the subjective evaluation employees make about the fairness of practices in the organization in which they work and whether they perceive acts within their organisation as 'fair' (Greenberg, 1990; Tepper, 2001). Organisational justice studies have previously tended to focus on outcomes related to organisational efficiency such as work performance, counterproductive behaviours, organisational citizenship behaviours, organisational trust and organisational commitment (see Cohen-Charash & Spector, 2001 for a review). The tendency to study organisational level outcomes is gradually being overtaken by a body of research investigating the impact of organisational justice on employee level outcomes.

Research studies into the effects of organisational justice on measures of employee wellbeing were virtually non-existent as recently as 10 years ago (Tepper, 2001). However, researchers in the past decade (Fujishiro & Heaney, 2007) have begun to investigate the relationship between perceptions of organisational injustice and a range of adverse employee health outcomes including coronary heart disease risk scores (Kivimaki, et al., 2005), lowered wellbeing (Elovainio, et al., 2002; Kivimaki, et al., 2004), increased psychological distress (Sutinen, Kivimaki, Elovainio, & Virtanen, 2002; Tepper, 2001) and depression (Ybema & van den Bos, 2010; Ylipaavalniemi, et al., 2005). In general, these findings indicate that low levels of organisational justice are related to various measures of poor health. In addition to the adverse effects of low levels of organisational justice on health, it is possible that high levels of organisational justice may promote health. Preliminary research found that both favourable and unfavourable changes in the level of organisational justice were associated with commensurate increases and decreases, respectively, in reported health (Kivimaki, et al., 2004). This finding suggests that future research studies within the area of organisational justice may benefit from including positive measures of health or considering the effects of justice, as opposed to injustice, on health outcomes.

The development within organisational justice research, from focusing on organisational outcomes to more recently studying the effects of justice on health has perhaps occurred, at least in part, due to the conceptual overlap between job characteristics and justice (Fujishiro & Heaney, 2007). Perhaps the recognition of similarities between studies of stress and organisational justice has contributed to a growing number of researchers incorporating job characteristics with organisational justice as antecedents in order to compare their explanatory capacity.

Although limited in number, the results of DCS-justice studies tend to suggest that organisational justice is significantly related to health over and above the DCS job characteristics (e.g. Elovainio, et al., 2002; Kivimaki, et al., 2005; Kivimaki, et al., 2004; Zohar, 1995). After controlling for a number of job stressors, including role overload (i.e., job demand), decision latitude (i.e., job control), social support, role conflict and role ambiguity, one of the earliest research studies to combine job characteristics and justice found that a global measure of organisational justice was related to all of the outcomes studied including psychological health (Zohar, 1995). The results of this particular study, according to the author, support an incremental or additive model whereby organisational justice is an additional source of occupational stress. A group of Finnish researchers who have been paving the way thus far within the study of organisational justice by combining job characteristics and organisational justice found similar results in one of their cross sectional studies where organisational justice remained to be significantly associated with self-rated health and minor psychiatric disorders after controlling for job demand, job control and social support (Elovainio, et al., 2002). Similar results have been obtained in longitudinal justice-health studies, where organisational justice remained to be significantly related to the outcome variables (reduced risk of coronary heart disease in one study and reduced risk of poor self-rated health in another study), after controlling for psychosocial work characteristics (Kivimaki, et al., 2005; Kivimaki, et al., 2004). Therefore, it is possible that organisational justice may make an independent or unique contribution to employee health over and above the contribution/s provided by the more commonly studied job characteristics. This capacity for organisational justice to contribute unique variance to employee health outcomes has resulted in organisational justice being hailed as the ‘new psycho-social predictor of health’

(Elovainio, et al., 2002). However, it may be premature to adopt organisational justice in favour of job characteristics, such as job demand, job control and social support, as there are aspects of the justice-health relationship that remain under-researched.

A review of the organisational justice literature demonstrates that studies have tended to be limited to investigating the effects of only one, two or three types of organisational justice, as opposed to investigating the impact of the full complement of organisational justice types. Procedural justice and distributive justice have been included as separate predictors of health in some studies (de Boer, Bakker, Syroit, & Schaufeli, 2002; Greenberg, 1990; Nurse & Devonish, 2007; Tepper, 2001), while three types of justice, namely procedural justice, distributive justice and interactional justice have been used in other research (Spell & Arnold, 2007). Relational justice, which isn't strictly one of the four types of justice (Colquitt, 2001) has been used in isolation from other organisational justice types (Kivimaki, et al., 2004), and alongside procedural justice in some studies (Elovainio, Kivimaki, & Helkman, 2001; Elovainio, et al., 2002). Finally, procedural justice has been used alongside interpersonal justice in other work (Judge & Colquitt, 2004). Focusing on the effects of one, two or three types of organisational justice, rather than taking a more global approach, is somewhat troublesome because it encourages the field to be fragmented (Ambrose & Arnaud, 2005). Further, by including a limited number of organisational justice types as antecedents, it is possible that the strength of the relationships between the included justice types and the outcome may be misleading. The relationship may be misleading because through the omission of one type of justice, for example, the other justice dimensions may pick up the variance from the type of justice that was omitted, subsequently resulting in a relationship that may indicate a stronger relationship than is genuinely the case (Greenberg & Colquitt, 2005).

Finally, in addition to the issue of how organisational justice has been conceptualised in previous research studies, it has been claimed that there are few, "if any", previous organisational justice studies to consider the impact of justice on measures of chronic strain, such as psychological distress or depression (Tepper, 2001).

2.4.1 Distributive Justice

The first type of organisational justice that was proposed was 'distributive justice' (see Greenberg, 1990) which focuses on the fairness of particular outcomes, such as pay and promotions, awarded to an individual (Cohen-Charash & Spector, 2001). The concept of distributive justice was borne out of equity theory, which contends that people compare their perceived level of work inputs with their work outcomes and compare this ratio to the ratios to similar others, such as co-workers (Adams, 1965; Walster, Walster & Bernscheid, 1978). An individual who perceives that their ratio of inputs and outputs is equitable (i.e. work effort rewarded through appropriate pay) and also perceives that their outcome is comparative to similar others is likely to perceive the organisation as distributively fair. However, an individual who deems their outcome to be inequitable in light of their level of input is likely to perceive the organisation as distributively unfair or unjust, and may also experience negative feelings such as anger (Folger & Cropanzo, 1998; Greenberg, 1990; Mikula, 1993). Although the focus within the organisational justice literature tends to be on the effects of being under-rewarded, equity theory also refers to situations of being over-rewarded (Adams, 1965).

Regardless of whether an individual perceives that they have been under-rewarded or over-rewarded, the existence of an inequitable relationship is likely to motivate the individual to correct the situation in order to make it equitable. It has been suggested that individuals

who believe they have been allocated an inequitable outcome may physically alter their input to a level commensurate with the outcome, in terms of quality and/or quantity of work (Cohen-Charash & Spector, 2001). Aside from behavioural adjustments through altering the level of input, individuals may seek to make the relationship between their input and outcome more equitable through cognitive adjustments or changing their perception of the input and/or outcome (Adams, 1965). Although equity theory considers situations of under compensation and over compensation as inequitable, the organisational justice literature tends to focus on the effects of under compensation. Organisational justice researchers have found, for instance, that distributive injustice is directly related to psychosomatic health complaints at time one and indirectly related (through psychosomatic health complaints) to sickness absence frequency at follow-up (de Boer, et al., 2002). Distributive justice has also been found to be related to emotional exhaustion and depression in both cross-sectional and longitudinal studies (Spell & Arnold, 2007; Tepper, 2001). Aside from employee health outcomes, distributive justice has also been found to predict outcome satisfaction, job satisfaction, organisational commitment, agent and system-referenced evaluation of authority, withdrawal, organisational citizenship behaviours, and performance (Colquitt, Conlon, Wesson, Porter, & Yee Ng, 2001).

In addition to considering whether the outcomes received are equitable in view of the level of their input, employees also make judgements regarding the fairness of the decisions used by the organisation in determining the level of outcomes received. Where perceptions of distributive justice are specific to the particular outcome, perceptions of procedural justice, the name of the second type of organisational justice to be discussed, are directed towards the whole organisation (Austin & Walster, 1974; Cropanzo & Folger, 1991).

2.4.2 Procedural Justice

Procedural justice is concerned with the perceived fairness of procedures an organisation uses to make decisions about the allocation of resources or outcomes (Cohen-Charash & Spector, 2001). Procedural *injustice* has been defined as a misfit between desired and perceived procedures (Schmitt & Dorfel, 1999). The concept of procedural justice developed out of the instrumental model which emphasised two types of control or input individuals may have in terms of decisions; (a) process control or the opportunity to influence the information used by an organisation during decision making, and; (b) decision control, which allows the individual to be heard and provides an opportunity to affect the decision (Thibaut & Walker, 1975). Empirical studies have found that when individuals are allowed some degree of control over the decision making process, they are more likely to perceive the outcome as fair (e.g., Walker et al., 1979). This proposition is based on the belief that if individuals are given the opportunity to influence the procedures used during decision making, then such control could lead to more favourable outcomes for themselves (Greenberg & Folger, 1983). Individuals therefore, according to the self-interest model, seek opportunities for control over the processes used to decide outcomes in the organisation in which they work for their own self-benefit (Tyler, 1987).

In contrast to the self-interest model, the group-value model suggests that people desire the opportunity to participate in decision making not necessarily to control the outcome, but because it presents them with an opportunity to promote the relationships within their group at a team and/or organisational level (Lind & Tyler, 1988; Tyler, 1989). In particular, expressing the opinion of the group regarding the organisation's decision making processes enhances feelings of group solidarity (Lind & Tyler, 1988). Whether employees perceive

decisions made by their organisation to be procedurally just or unjust depends on a number of factors including whether the procedures used by the organisation were (a) consistent, across both people and time, (b) free from bias or vested interest, (c) utilised accurate information, (d) are amenable to corrections, (e) adhere to ethical and moral obligations, and (f) consider the opinions of employees who may be potentially affected by the decision (Leventhal et al 1980).

Procedural justice has been found to be significantly associated with a vast range of variables including salary, work performance, organisational support, organisational citizenship behaviours, counterproductive work behaviours, conflict with others, job satisfaction, management satisfaction, affective commitment, continuance commitment, normative commitment, trust in the organisation, turnover intentions, intention to recommend the organisation to others and self esteem (see Cohen-Charash & Spector, 2001). The first study to investigate the relationship between procedural justice and psychiatric disorders found that individuals who reported low levels of procedural justice were 1.9 times more likely to be diagnosed by a doctor as having a psychiatric disorder than individuals with a high level of procedural justice (Kivimaki, Elovainio, Vahtera, Virtanen, & Stansfeld, 2003). The authors found that the significant association remained between procedural justice and psychiatric disorder diagnosis after adjusting for mental health at baseline and after controlling for the DCS job characteristics. Procedural justice has also been found to be significantly related to negative affectivity (Cohen-Charash & Spector, 2001) and depression (Tepper, 2001). Aside from direct effects, procedural justice may indirectly impact on the experience of stress through work and family conflict (Judge & Colquitt, 2004) or job control (Elovainio, et al., 2001). It has been suggested that procedural justice may be closely

associated with a third form of organisational justice, known as interactional justice (Wiili-Peltola, Kivimaki, Elovainio, & Virtanen, 2007).

2.4.3 Interactional Justice –Interpersonal and Informational Justice

Distributive justice and procedural justice are structural types of organisational justice that focus on the fairness of outcomes allocated and the procedures used to allocate outcomes. In comparison, interactional justice refers to the interpersonal conduct of the parties who are in charge of the resource allocation decisions (Bies & Moag, 1986; 1989) and focuses on "the human side of organisational practices" (Cohen-Charash & Spector, 2001, p. 281). Interactional justice was proposed as additional type of organisational justice to overcome the lack of attention paid to social interactions by the previously proposed types of organisational justice (Bies & Moag, 1986). Interactional justice is likely to be fostered if members of management justify the decision making procedures used by the organization and treat employees with respect and sensitivity (Colquitt, 2001). Although a review of the literature indicates that some justice researchers have adopted interactional justice as the third, and final, type of organisational justice, it appears that interactional justice may be more appropriately thought of as an umbrella term for two more specific types of justice that both consider social interactions.

A review of the literature suggests that interactional justice consists of two sub-sets of organisational justice, known as interpersonal justice and informational justice. Interpersonal justice refers to the degree to which people are treated with respect, dignity and the like; comparatively, informational justice refers to explanations as to why procedures were implemented in the manner they were (Greenberg, 1990; 1993). Therefore, employees are

more likely to perceive the procedures used and outcomes provided by their organisation to be fair if they receive (a) quality interpersonal treatment from the decision-makers within the organisation, and (b) sufficient information about decision making procedures (Bies & Moag, 1986; Tyler & Bies, 1989). Sincerity on the part of the decision maker, for instance, along with an explanation for a course of action is likely to lead people to perceive the procedures as being fair (Bies & Shapiro, 1988; Greenberg, 1988). It has been suggested that interpersonal justice is closely aligned with distributive justice and informational justice is closely aligned with procedural justice (Cohen-Charash & Spector, 2001).

Although interpersonal justice and informational justice are highly correlated, they are not so highly correlated that they should be lumped together as 'interactional justice' (Colquitt, et al., 2001). Similar claims, that interpersonal justice and informational justice are distinct have been made by other researchers (Greenberg, 1993). Although there are few research studies to date that have investigated the independent effects of interpersonal justice and informational justice, the literatures suggests that researchers should investigate the effects of each type of justice independently, rather than combining them into a collective type of interactional justice.

2.4.4 Organisational Justice and Health - Interaction Effects and Curvilinearity

Much of the previous research examining the relationship between perceptions of organisational justice and health has focused on main effects or a direct relationship (i.e., where perceptions of justice or injustice lead to increases or decreases in health). Recently however, there has been increasing interest within the organisational justice discipline in regards to possible interaction effects between certain dimensions of organisational justice

(Tepper, 2001). In particular, a small number of justice-health studies have considered the capacity for procedural justice to off-set the negative effects of unfavourable distributive justice decisions; that is, the 'fair process effect' (Van den Bos, 2005). The fair process effects tends to be conceptualized in terms of procedural justice moderating the effect of distributive justice, however, it can also be conceptualized in terms of distributive justice moderating the effect of procedural justice, depending on the particular research question (Brockner & Wisenfeld, 1996). This two-way interaction effect, between procedural and distributive justice, regardless of how it is conceptualized, appears to be the most commonly studied interaction effect in research studies in the organisational justice literature when curvilinearity is accounted for. However, researchers have also investigated the impact of other types of organisational justice interaction effects (e.g., distributive justice by interpersonal justice; procedural justice by informational justice; interactional justice by distributive justice) on outcomes such as anxiety, depression and job satisfaction (Loi, Yang, & Diefendorff, 2009; Spell & Arnold, 2007).

The distributive by procedural justice interaction (D x P) has been associated with a number of employee health outcomes including emotional exhaustion, anxiety and depression (Spell & Arnold, 2007; Tepper, 2001). Although all combinations of distributive justice and procedural justice (e.g., high distributive and low procedural; high procedural and low distributive; high distributive and high procedural; low distributive and low procedural) may be significantly related to employee health within a study, as they were in Tepper's (2001) study, the interaction effect appears to be most adverse when both types of justice are at low levels (Brockner & Wisenfeld, 1996). For instance, individuals with low levels of both

distributive and procedural justice experienced the worst psychological health in comparison to other individuals (Tepper, 2001).

The majority of studies that have accounted for an interaction effect between dimensions of organisational justice, such as distributive and procedural justice, have been concerned with the individual in question. However, the fair process effect may also apply in situations where the injustice is observed, rather than occurring to oneself. Based on the results of a study that considered observers' reactions to another person's injustice, individuals are likely to perceive distributive injustice as being less severe when procedural justice was high, as opposed to when procedural justice was low (Hegtvedt, Johnson, Ganem, Waldron, & Brody, 2009). This finding suggests that the buffering effect of procedural justice may apply not only in terms of one's' own justice, but also in terms of perceptions of others' injustice. Further clarification of the moderating effects of procedural justice would provide important insights into how justice-related decisions should be managed in order to minimize the associated fall-out. Future organisational justice studies would benefit from including the two-way interaction effect between procedural justice and distributive justice to address the lack of information on the buffering effects of organisational justice.

Considering that the majority of previous organisational justice research has tended to focus on direct effects, the possibility that dimensions of organisational justice may have a curvilinear relationship with employee outcomes requires clarification. Based on evidence that suggests that non-linear relationships may exist between working conditions and outcome variables, coupled with their apparent conceptual overlap with organisational justice, it is possible that organisational justice may also exhibit non-linear effects. Support for the curvilinearity of organisational justice dimensions would suggest that the positive effects of

justice may be attenuated at high levels and/or that employee health may deteriorate when perceptions of justice are high. This being the case, perceptions of justice may have strong initial benefits, if initial levels of justice were inadequate, as well as diminishing returns if justice levels were already high. Including tests of curvilinearity in future organisational justice studies would perhaps provide information on how working conditions need to be modified in order to optimize employee health.

2.4.5 Summary

In summary, employees determine whether or not the organisation they work for is just by considering the fairness of specific outcomes and practices. The fairness of outcomes allocated to employees is captured by distributive justice, whereas the fairness of decision making practices is captured by procedural justice. In addition, the interpersonal conduct of decision makers within the organisation and whether they treat employees with respect and dignity, and provide adequate information regarding decisions, is taken into account by interpersonal and informational justice. Organisational justice has been linked to an array of outcomes in previous studies. Recent research suggests however that the effect of organisational justice on employee health is particularly significant, perhaps more so than the effect of job characteristics on employee health. Consequently, including organisational justice dimensions alongside job characteristics may provide a richer picture as to how the work environment impacts on the health of employees and may subsequently provide organizations with practical information as to how they can optimize the mental health of employees.

2.5 Stress and Employee Mental Health

Aspects related to an individual's job, such as an unreasonable amount of work, inadequate control and insufficient support are well accepted within the literature as having the potential to contribute to employee stress and ultimately, to poor mental health (Thomas & Hite, 2002). Although research into the associations between job characteristics and employee mental health may be a popular area of inquiry (Hausser, et al., 2010), it appears that the effects of job characteristics on various mental health outcomes is not yet fully understood.

A vast number of empirical studies, as evidenced by meta-analytic reviews, have investigated the relationships between some or all of the components of the DCS model and mental health, usually in the form of psychological wellbeing (Hausser, et al., 2010; van der Doef & Maes, 1999). In line with the premise of the DCS model, results generally indicate that high levels of job demands have a negative effect on psychological wellbeing and low levels of job control and/or social support tend to also have a negative effect on psychological wellbeing. Although psychological wellbeing tends to be the most popular measure of mental health in DCS studies (Furukawa, Kessler, Slade, & Andrews, 2003; Gill, Butterworth, Rodgers, & Mackinnon, 2007; Hausser, et al., 2010; van der Doef & Maes, 1999), it has been claimed that it is important that researchers include additional mental health outcomes in their research projects, particularly those of increased severity, in order to more fully understand the association between the work environment and mental health (Warr, 2003).

Psychological distress is another indicator of mental health that is used within occupational stress research. Similar to psychological wellbeing, psychological distress is a general or context-free measure of mental health (Kessler, et al., 2002). Ratings of psychological distress tend to be skewed, with people generally indicating that their level of

distress is negligible (e.g. Andrews & Slade, 2001). Although research indicates that people tend to have relatively low as opposed to high levels of psychological distress, population statistics nevertheless indicate that a substantial proportion of people may be impaired by psychological distress. A report from an Australian population questionnaire stated that approximately 13% of the Australian population suffers from 'high' or 'very high' levels of psychological distress, with 9% and 4% reported respectively for each level (Australian Bureau of Statistics, 2006). According to the same population questionnaire, the likelihood of experiencing psychological distress is greatly increased for individuals with a long term mental health issue and tends to co-exist in almost 50% of these cases (Australian Bureau of Statistics, 2006). Based on the alleged prevalence of psychological distress, it appears to be a key mental health outcome.

In contrast to psychological wellbeing and distress, depression is a more enduring clinical syndrome (Cotton, 1995) characterised by "gloom, despair and a general lack of enthusiasm" (Spell & Arnold, 2007, p. 727). Although depression may be considered to be a more severe form of mental health illness, it seems that there is a gap in population level information, particularly in regards to work. In Australia, it has been claimed that as many as one in five, or approximately 20%, of citizens suffer from depression (Beyond Blue: The National Depression Initiative, 2008; Clarke & Currie, 2009). It is possible that the number of Australians suffering from depression may be higher than official estimates, however, with the majority of people with mental illness, including depression, not seeking professional assistance (Australian Bureau of Statistics, 2009). Further, a review of population-wide surveys in Australia, such as the National Health Survey (NHS) and National Survey of Mental Health and Wellbeing (NSMHW), indicates that the official rates may be

underestimated because population surveys do not consistently contain a depression-specific instrument. The NHS, for example, appears to not have included a direct measure of depression since 1995 when it investigated age-related depression and the number of recent or long-term cases (Australian Bureau of Statistics, 1997). The NSMHW appears not to have included a depression specific measure since 2007 when it asked for information on lifetime and 12 month "depressive episodes" (Australian Bureau of Statistics, 2008). In addition to not consistently including a depression measure, the NHS and NSMHW questionnaires have not in their histories provided depression prevalence statistics specific to sub-groups, including employed persons (Mackinnon, Jorm, & Hickie, 2004). Therefore, without a population questionnaire that contains a job-specific depression measure, it is unclear how many Australians have depression attributable to their job.

There is evidence to suggest that depression may be caused by job characteristics. Based on the results of a recent study based on the Australian state of Victoria, it is possible that as many as 13 to 17% of persons with depression are suffering from their mental health illness due to conditions of the work environment, including high job demands, low job control and low social support (LaMontagne, Keegel, Vallance, Ostry, & Wolfe, 2008). Considering that more than 54% of adult Australians between the ages of 25 and 64 are in the paid workforce (Australian Institute of Health and Welfare, 2008) it is perhaps remiss that population surveys do not include a depression measure specific to employed persons.

Although population surveys in Australia do not tend to account for depression, national surveys such as the NHS and the NSMHW do tend to consistently include measures for psychological wellbeing and psychological distress. A measure of psychological wellbeing, The General Health Questionnaire (GHQ-12) was last used in a national survey in

1997, before it was superseded by a measure of psychological distress, known as the Kessler Psychological Distress Scale or K10 (Australian Bureau of Statistics, 2003). Both the GHQ-12 and the K10 scales have been used in population studies by researchers in a variety of locations around the world (Donath, 2001; Kessler, et al., 2002), however, the K10 has been found to be more suitable for epidemiological studies because of its development with a non-clinical sample and its stronger relationship with medically diagnosed depression than the GHQ-12 (Australian Bureau of Statistics, 2003; Furukawa, et al., 2003; Gill, et al., 2007). Nevertheless, the GHQ-12 remains a valid measure, as indicated by an analysis of the 1997 NSMHW data that found scores on the GHQ-12 to be significantly related to subjective wellbeing in the expected direction (Coyne, 1994). Although it is preferable to collect depression statistics directly (Coyne, 1994), it is possible to use the cut-off scores for short screening scales, including the GHQ-12 and the K10, to estimate the prevalence of depression. The recommended cut-off point on the GHQ-12 is 10/11 (Donath, 2001), while the recommended cut-off point on the K10 is 30 (Australian Bureau of Statistics, 2003). Consequently, using scores obtained from employed persons on the psychological wellbeing or the psychological distress scales, it may be possible to determine the prevalence of work-related depression in the wider Australian population, at least until a direct measure of depression, specific to employed persons, is included in population surveys.

It appears that the reason researchers tend to concentrate on psychological wellbeing and fail to include other indicators of mental health, including depression, is due to some confusion regarding whether the presence of wellbeing simultaneously indicates an absence of poor mental health symptoms. That is, some researchers contend that psychological wellbeing and depression exist along the same continuum and are the opposites of each other, with

depressive symptoms diminishing alongside increases in wellbeing (Katschnig & Angermeyer, 1997; Holloway & Carson, 1999; Dear, Henderson, & Korten, 2002). Therefore, perhaps researchers who subscribe to this perspective are likely to measure only one extreme of the continuum in the belief that it explains the full spectrum of mental health. In contrast, other researchers subscribe to the view that wellbeing and depression are both worthy of investigation, because they are separate, possibly orthogonal, constructs and do not exist along the same continuum (Headey & Wearing, 1992).This perspective, that various aspects of mental health are separate and therefore should each be studied independently, is supported by additional research. In particular, it has been suggested that mental health consists of dichotomous factors and that psychological wellbeing and psychological distress tap into the anxious-comfortable factor and that depression taps into the depressed-actively factor (Warr, 1987). Therefore, it appears that psychological wellbeing and distress are empirically distinct when compared to depression and provides support for the view that multiple indicators of mental health are worthy of inclusion in occupational stress studies, rather than focusing mainly on psychological wellbeing. In the present thesis, the influence of the work environment on mental health will be investigated in terms of three outcomes, psychological wellbeing, psychological distress and depression.

In addition to context-free measures of mental health, it has been suggested that mental health consists of a construct known as satisfaction (Danna & Griffin, 1999). Satisfaction may be a context-free or it may be context-specific in the form of job satisfaction. Job satisfaction has been defined as being “a pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences” (Locke, 1976, p. 1300). It has been suggested that job satisfaction (or dissatisfaction) depends on a number of work-related factors including

organisation of work, content of one's' job, working conditions and relationships with others, including supervisors and colleagues (Kasl, 1973). A meta-analysis of DCS studies published between 1979 and 1997 indicates that job demand, job control and social support are "fairly consistently" related to job satisfaction (van der Doef & Maes, 1999). It is possible that the rather high association between the DCS components and job satisfaction is due to the temporal nature of the studies, with the majority being cross-sectional in nature. The results of a more recent DCS meta-analysis (i.e., studies published between 1998 and 2007), which had a higher number of longitudinal studies in comparison to the earlier meta-analysis, found that the components of the DCS model are more likely to be related to job-related mental health (i.e., job satisfaction) in cross-sectional rather than longitudinal studies (Hausser, et al., 2010). Job conditions as captured by the DCS model therefore appear to be related to job satisfaction, although whether this effect is limited more so to cross-sectional studies than longitudinal studies is unclear.

Finally, the impact of work characteristics such as high job demands on mental health may depend on the industry the individual is employed within, with people working within manufacturing, property, retail and other service-based industries (e.g., healthcare and law enforcement) being more likely to experience poor mental health, in the form of anxiety for example, than individuals working within alternate industries (Waghorn, Chant, White, & Whiteford, 2005).

2.5.1 Summary

In summary, it appears that the mental health of employees is determined, at least to an extent, by their work environment. The influence of job characteristics on mental health outcomes has

been somewhat limited historically to psychological wellbeing, with other mental health outcomes, particularly depression, being largely neglected. Measures of depression do not tend to feature consistently in population surveys in Australia and such population surveys have not in their histories obtained information about depression rates for employed persons. In contrast, measures of psychological wellbeing and distress have tended to be consistently included in population surveys and although they, similarly, have not been specific to employed persons, it is possible to infer depression rates from psychological wellbeing and distress scores using cut-off points. Using scores obtained from a sample of employed persons on measures of psychological wellbeing and distress can be used to infer depression rates specific to employed persons. In addition to measures of mental health, including psychological wellbeing, distress and depression, mental health is derived from levels of satisfaction. The job satisfaction of employees, a job-specific measure of mental health may also be influenced by job characteristics as evidenced by previous meta-analytic studies. The extent to which job characteristics impact on the mental health of employees may depend not only on the levels of job characteristics but also on whether or not the employee works within a higher risk occupation.

2.6 The Occupation of Policing

The mental health of employees working within certain industries, including service-based industries (i.e., healthcare and law enforcement), may be more at risk compared to individuals working in other industries (Penk, Drebing, & Schutt, 2002; Waghorn, et al., 2005). Compared to individuals employed in most other occupations, police officers are exposed to a number of physical and psychological situations that may negatively impact on their health

and wellbeing (Pasillas, Follette, & Perumean-Chaney, 2006). It is the demanding nature of the experiences faced within policing that render the occupation as stressful (Aaron, 2000), and (such circumstances perhaps) explain why police work consistently ranks within the top five most stressful occupations (Dantzer, 1987). It is perhaps not surprising, therefore, that studies within the police literature tend to focus on the impact of job-related or operational stressors on health, with researchers assuming that stressful on-the-job experiences are likely to have the most adverse effects on police officer mental health (Burke & Paton, 2006; Paton, Violanti, & Burke, 2009). The operational stressors of policing that have been reported as most stressful, according to both frequency and intensity, include attending to domestic disputes, being faced with a situation that may cause injury to oneself and being confronted by an individual with a weapon (Anshel, Robertson, & Caputi, 1997). In addition to encountering situations such as these on a regular basis, police officers are likely to experience a number of more severe or critical incidents during their employment (Paton, et al., 2009).

In addition to the job-related stressors that police officers are likely to encounter as part of their operational duties, another category of stressors, known as organisational stressors, may also influence the health of police officers (Abdollahi, 2002). Organisational stressors, or stressors that are related to the context of the organisation, may be equal in importance, or more important, than operational stressors (Paton, et al., 2009). The relative importance of organisational stressors has been demonstrated in studies that have found that police officers report organisational stressors between three to four times more often than job-related stressors (Brown & Campbell, 1990; Slate, Johnson, & Colbert, 2007). There is evidence to suggest that in addition to being reported more frequently by police officers, organisational stressors may be significantly related to some outcomes that job-related

stressors are not significantly related to. In particular, a large study of police officers within Australia compared the relative importance of operational (job content) stressors and organisational (job context) stressors and found that the organisational stressors, organisational change and lack of social support, were both significantly related to police officer job stress in the expected directions, while the job-related stressors commonly considered to be determinants of police officer stress (i.e., coping with dangerous, uncontrollable situations) were not significantly related to job stress (Davey, Obst, & Sheehan, 2001). It has been suggested that the impact of organisational stressors on stress level may be greater than that of operational stressors because they are imposed by management, and may consequently be perceived as inescapable (Shane, 2010). In contrast, operational or job-related stressors are expected by police officers as part of their duties and therefore, due to being accepted as an inherent part of policing, operational stressors are perhaps less likely to influence level of job stress or officer wellbeing (Paton, et al., 2009). In relation to the primary aim of this thesis, it is possible that organisational *injustice* (i.e., a stressor related to the organisation) may have a greater impact on employee health than job-related or operational stressors.

In addition to organisational support and organisational change, there are other factors that may also influence the level of stress experienced by officers. There is evidence to suggest, for instance, that the location of the agency that the officer works within may determine their level of stress. Police officers working in rural areas have been found to be less stressed than officers working in suburban areas, metropolitan areas or regional cities (Davey, et al., 2001). These results suggest that working within more remote police

organisations is perhaps better for employees in terms of the level of stress they are likely to experience.

In addition to the objective characteristics of the organisation, research also suggests that whether police officers have an opportunity to influence decisions within the organisation may also partly determine whether they experience job stress and to what extent. In a study of probation officers, researchers found that employees who have the opportunity to provide input into the decisions made within their organisation are likely to be less stressed compared to employees who are not offered such an opportunity (Slate, Wells, & Johnson, 2003). Autocratic management style within police organisations has the potential to be an organisational stressor, because it constrains the level of decision-making control an employee has over their job at a time when they perhaps need to be able to make fast decisions about an evolving situation (Paton & Flin, 1999). Similarities may be drawn between the use of an autocratic management style and the notion of procedural injustice. As discussed in section four, procedural justice is concerned with the perceived fairness of procedures an organisation uses to make decisions about the allocation of resources or outcomes (Cohen-Charash & Spector, 2001). Employees who are allowed to exert some degree of control over the decision making processes within their organisation are likely to perceive any resulting outcomes as fair (e.g., Walker et al., 1979). Consequently, an employee, or police officer, may experience less job stress due to the opportunity they have been given to provide input. In addition to operational and organisational stressors influencing the level of job stress reported by police officers, the mental health of police officers is also likely to be affected by years of job experience.

2.6.1 Police Officer Experience, Stress and Mental Health

Throughout their careers, it has been suggested that police officers pass through a number of stages that are associated with years of experience on the job known as "reality" (0-5 years), "disenchantment" (6-13 years), "personalisation" (14-20 years) and "introspection", more than 20 years experience (Violanti, 1983). According to the author, individuals who are new to policing are learning that the realities of police work are perhaps different to what they had expected, while during the second stage, police officer stress increases sharply as officers are exposed to police work and the demands of policing are seen as taxing and 'stressful'. Police officers who have worked within the police force for more than 14 and 20 years, respectively, are less concerned about job demands than their younger counterparts and begin to focus on personal aspirations and reflect on their careers. Considering the stages police officers may pass through during their careers, it is plausible that years of experience within the police force and length of exposure to stressors may influence level of job stress. Research carried out with a police sample suggests that level of reported stress is highest for officers who have worked within the force for a moderate amount of time compared to officers with minimal or extensive experience (Patterson, 1992; Violanti, 1983). Similar results have been found in terms of mental health, whereby prison officers (who similarly work within public safety) with an intermediate level of experience reported poorer mental health, measured using the General Health Questionnaire (GHQ-12), than officers with minimal or extensive experience (Lanuay & Fielding, 1989).

In line with previous research, there is evidence to suggest that the psychological health of police officers may depend on years of experience within policing. The authors of a Swedish study found that on admission into a police academy, the mental health of police

trainees was better than individuals from the general population and police trainees were characterised as being more bold, confident and outgoing compared to individuals of same gender and similar age (Ghaziniour, Lauritz, Du Preez, Cassimjee, & Richter, 2010). In contrast, a study of sworn police officers, who had an average of 12.4 years of job experience, were found to have twice the rate of psychological distress compared to adult non-patients (see Pasillas, et al., 2006). Therefore, in contrast to the police trainees who have little job experience, the psychological health of sworn police officers was worse than the psychological health of individuals in the general population. In addition to having greater experience within policing, the police officers are likely to have had increased exposure to stressors associated with policing. There is evidence to suggest that with greater exposure to negative life events and traumatic incidents, the impact of these experiences on the mental health of police officers may become more adverse, with increases in exposure related to an increase in depression (Hartley, Violanti, Fekedulegn, Andrew, & Burchfiel, 2006). Within the policing population as a whole, there is research to suggest that between 7 and 20 percent of police officers will experience post traumatic stress disorder (PTSD) during their careers, with PTSD being a mental health issue associated with exposure to traumatic incidents (see Paton, et al., 2009). In addition to investigating the influence of job stress on outcomes of general or context-free mental health among police officers, some researchers have also explored the impact of police officer stress on job satisfaction, a context-specific measure of mental health.

2.6.2 Policing and Job Satisfaction

Job satisfaction has been suggested to be an appropriate measure of mental health for use with a police force sample for investigating the influence of job-related and organisational stressors (Burke & Paton, 2006). Although occupational stress researchers have paid considerable attention to the topic of job satisfaction in the past, there are limited empirical studies that have examined job satisfaction among the police force specifically (Brown & Campbell, 1990; Dantzker & Surrette, 1996; Davey, et al., 2001). It has been suggested however, that the level of job satisfaction reported by police officers is similar or higher than the level of job satisfaction reported by employees in other occupations typically regarded as being less demanding (Hart, 1999). In addition, the level of job satisfaction reported by male and female police officers is similar (Dantzker & Kubin, 1998). A large study of over 2,600 police officers across seven states of America found that the antecedents of job satisfaction were availability of supervisor, willingness of supervisor to help, benefits including compensation for overtime, present assignment, job and general job duties (Dantzker & Surrette, 1996). In an Australian study of approximately 800 police officers, shiftwork, dangerous job aspects, organisational support and organisational change were found to be significantly related to job satisfaction (Davey, et al., 2001). Interestingly, exposure to dangerous aspects of policing has been found to be positively, rather than negatively, related to job satisfaction (Davey, et al., 2001; North, et al., 2005). Social support provided by supervisors, colleagues and the public has also been found to significantly impact on the job satisfaction reported by police officers (Davey, et al., 2001). When considered together, the results of these studies indicate that the determinants of job satisfaction are related to both aspects of the job and to characteristics of the organisation. Recently however, the relative influences of operational and organisational

stressors among the police force were compared and organisational hassles were found to be the strongest predictor of job satisfaction (Burke, 2009). Similar results have previously been found that suggest that organisational level stressors are more strongly related to job satisfaction, while operational stressors are perhaps more strongly related to more general mental health outcomes (Brough, 2004).

2.6.4 Summary

In summary, based on a review of previous studies of police stress, it appears that characteristics that are tied to the job may differentially impact on health compared to more organisational level characteristics. It is consequently important for research studies within the occupational stress arena to include both work characteristics and organisational level stressors. Although a small number of occupational stress researchers have begun to investigate the affect of both work characteristics (i.e., as measured by the DCS model) and organisational justice on employee health outcomes (Elovainio, et al., 2002; Kivimaki, et al., 2005; Kivimaki, et al., 2004; Zohar, 1995), previously conducted studies have not included the full range of organisational justice types and none of these studies have been conducted within the occupation of policing. Therefore, although it is expected that components of the DCS model and organisational justice will be significantly related to the mental health of police officers (based on findings within the broader occupational stress literature), it is unknown whether organisational justice will contribute unique variance to the outcome measures over and above the more established work characteristics for employees within the occupation of policing.

2.7 Rationale and Hypotheses of Proposed Research

The primary purpose of this thesis is to compare the predictive ability of work characteristics and organisational justice in terms of mental health among the police force. A review of the occupational stress literature revealed that the work environment, particularly in terms of job-related characteristics, is well recognised for its potential to impact on the mental health of employees (Begg, et al., 2007; Langlieb & DePaulo, 2008; Victorian Health Promotion Foundation, 2006). The work characteristics that are most commonly studied within the occupational stress literature tend to be job demand, job control and social support, with these components forming the basis of the widely used DCS model (Karasek, 1979; Karasek & Theorell, 1990). The DCS model has been found to have strong predictive capacity in a variety of occupational and industrial contexts and the components of the model have been associated with a variety of health outcomes including indicators of context-free mental health and work related job satisfaction (de Lange, et al., 2003; van der Doef & Maes, 1999).

Although each of the components has the potential to be significantly related to the health outcome under investigation, it is the joint or "multiplicative" effects of low job demand, low job control and/or high social support in particular, that are most likely to lead to poor psychological health (Karasek, 1979; Karasek & Theorell, 1990). Evidence for interaction effects between components of the DCS model is inconsistent. However, there is evidence to suggest that interactions between the components are associated with employee health in both cross-sectional and longitudinal studies (Parkes, et al., 1994; van der Doef & Maes, 1999). Based on previous research findings, it is hypothesised that:

Hypothesis 1a. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of context-free mental health

(i.e., psychological wellbeing) at one point in time. This hypothesis will be examined in Study One.

If a significant result is found (i.e., results support Hypothesis 1a), this would indicate that work characteristics are related to general, or non-specific, employee mental health, as measured by psychological wellbeing. There is solid evidence to suggest that this hypothesis will be supported, as a significant relationship between the DCS components and psychological wellbeing is commonly found within the occupational stress literature (van der Doef & Maes, 1999). However, as Study One is cross-sectional in nature, support for Hypothesis 1a does not perhaps indicate causality and warrants the need for a hypothesis in this thesis that tests for prospective effects. The decision to investigate the prospective relationship between the DCS characteristics and context-free mental health is supported by a recent meta-analytic finding that the additive effects of the DCS components are as likely to exist in longitudinal studies as cross sectional studies (Hausser, et al., 2010). In light of previous findings between work characteristics and mental health, it is hypothesised that:

Hypothesis 1b. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of context-free mental health (i.e., psychological wellbeing, psychological distress and depression) across a period of one year. This hypothesis will be tested in Study Two.

In the event that a significant relationship is found between the DCS model and context-free mental health indicators in the second study (i.e., the results support Hypothesis 1b) this suggests that the effects of work characteristics on employee health have persisted for at least

one year. Support for Hypothesis 1b would indicate causality and provide further support for Hypothesis 1a if it is also supported. In contrast to the first study, which has one measure of context-free mental health, the second study consists of three measures of context-free mental health. Psychological distress and depression will be included in the second study to ascertain whether work characteristics impact on psychological health outcomes of increased severity, rather than purely psychological wellbeing which is a positive measure of mental health

Meta-analyses of previous DCS research studies have found evidence that work characteristics (i.e., low job demand, high job control, high social support) are significantly related to job satisfaction and such evidence has been found in both cross-sectional and longitudinal studies (de Lange, et al., 2003; van der Doef & Maes, 1999). Based on previous findings between work characteristics and job satisfaction, it is hypothesised that:

> Hypothesis 2. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of job-specific mental health (i.e., job satisfaction) at one point in time. This hypothesis will be tested in Study One.

In addition to main effects, the occupational stress literature provides support for the existence of non-linear, or curvilinear, relationships between work characteristics and employee health outcomes. Researchers have found, for instance, significant curvilinear relationships between job demands and job satisfaction (J. de Jonge, et al., 1995; Warr, 1990), job control and job satisfaction, job control and emotional exhaustion (Fletcher & Jones, 1993; Warr, 1990), social support and job satisfaction, social support and emotional exhaustion, and social support and reduced personal accomplishment (J. de Jonge, et al., 1998; J. de Jonge, et al., 1995). These findings suggest that in addition to main effects (i.e., a low or high level of the

DCS characteristic), a moderate level of the characteristic may be associated with health and curvilinear effects should also be considered. Curvilinear effects will be accounted for in this thesis due to the inclusion of interaction effects, which form the basis for the DCS model. If curvilinear effects are not included prior to interaction effects, then any significant interaction effects may incorrectly suggest the existence of an offsetting (i.e., interactive) relationship that does not exist (Fletcher & Jones, 1993; Ganzach, 1997). It is hypothesised that:

> Hypothesis 3a. The work characteristics of the DCS model (i.e., job demand, job control and social support) will demonstrate a non-linear and/or interaction effect with the mental health outcomes (i.e., psychological wellbeing and/or job satisfaction) at one point in time. This hypothesis will be tested in Study One.

It is also predicted that the non-linear and/or interaction effects will persist across time. Specially, it is hypothesised that:

> Hypothesis 3b. The work characteristics of the DCS model (i.e., job demand, job control and social support) will demonstrate a non-linear and/or interaction effect with the mental health outcomes (i.e., psychological wellbeing, psychological distress and depression) across a period of one year. This hypothesis will be tested in Study Two.

If support is found for Hypothesis 3b, whereby any curvilinear or interaction terms are significant, this would indicate that a non-linear or off-setting relationship exists between the predictor and outcome variable at one-year follow-up.

A major limitation of the DCS model is that by focusing on job-related aspects of the work environment, other conditions, such as broader organisational influences, with the potential to contribute to poor health are unduly neglected (Parker, et al., 2001; Tummers, Van Merode, & Landeweerd, 2002). Recently, occupational stress researchers, have begun to consider the impact of organisational in/justice, an organisational influence, on a range of employee health outcomes including coronary heart disease risk scores (Kivimaki, et al., 2005), lowered wellbeing (Elovainio, et al., 2002; Kivimaki, et al., 2004), increased psychological distress (Sutinen, et al., 2002; Tepper, 2001) and depression (Ybema & van den Bos, 2010; Ylipaavalniemi, et al., 2005). A small number of these researchers have included the components of the DCS model and organisational justice within the one study, with results suggesting that organisational justice may be a more important determinant of employee health outcomes than more established job-related predictors (Elovainio, et al., 2002; Kivimaki, et al., 2005; Kivimaki, et al., 2004; Zohar, 1995). Although researchers are yet to investigate the influence of organisational justice *per se* on the health of police officers, the relative importance of organisational stressors has been demonstrated in previous studies (Brown & Campbell, 1990; Slate, et al., 2007).

Hypothesis 4a. Organisational justice will contribute unique variance to employee mental health (i.e., psychological wellbeing and/or job satisfaction) over-and-above the variance attributed to the components of the DCS model at one point in time. This hypothesis will be tested in Study One.

The same hypothesis will be tested to investigate possible prospective effects of organisational justice. Specifically, it is hypothesised that:

Hypothesis 4b. Organisational justice will contribute unique variance to employee mental health (i.e., psychological wellbeing, psychological distress and depression) over-and-above the variance attributed to the components of the DCS model across a period of one year. This hypothesis will be tested in Study Two.

In order to test Hypotheses 4a and 4b, organisational justice will be entered into the respective analyses after the components of the DCS model (i.e., main, curvilinear and interaction effects) are accounted for. If a significant result is found between one of the dimensions of organisational justice and a measure of employee mental health, this would indicate that organisational justice contributes unique variance to the outcome variable over-and-above the variance accounted for by the work characteristics. This inference is based on the organisational justice variables being added into the data analyses after the effects of the DCS variables have been controlled for. If a significant relationship is found between organisational justice and an outcome measure in the second study (i.e., the results support Hypothesis 4b), this indicates that the influence of organisational justice remains at one-year follow-up.

There is a tendency for researchers to focus on the main effects of organisational justice. However, a small number of justice-health studies have tested for the "fair process" effect, or the capacity for procedural justice to off-set the negative effects of unfavourable distributive justice decisions through the inclusion of a two-way (procedural by distributive justice) interaction term (Van den Bos, 2005). Significant relationships have been found between this interaction term and health outcomes including emotional exhaustion, anxiety and depression

(Spell & Arnold, 2007; Tepper, 2001). The P x D interaction term will be included in both the cross-sectional and prospective studies in order to determine whether they are significantly related to measures of mental health (both context-free and job-specific). Curvilinear organisational justice terms are included in the analyses prior to the entry of the interaction term to ensure that the result is genuine should the interaction term be significant (Fletcher & Jones, 1993; Ganzach, 1997). In order to test for the presence of an off-setting organisational justice effect, it is hypothesised that:

> Hypothesis 5a. The procedural justice by distributive justice (P x D) interaction effect will be significantly related to mental health (i.e., psychological wellbeing and/or job satisfaction) at one point in time. This hypothesis will be tested in Study One.

A similar hypothesis will be tested in Study Two, to determine whether the fair process effect persists across time. Specifically, it is hypothesised that:

> Hypothesis 5b. The procedural justice by distributive justice (P x D) interaction effect will be significantly related to mental health (i.e., psychological wellbeing, psychological distress and depression) across a period of one year.

In contrast to Study One and Study Two, the third study does not include the DCS components or organisational justice types and is focused purely on the three context-free mental health outcomes. The purpose of Study Three is to explore the relationships between the three context-free mental health variables that are included as outcomes in the second study. Specifically, the relationships between the three mental health indicators will be explored by mapping psychological wellbeing and psychological distress separately onto depression. It is hypothesised that:

Hypothesis 6. The cut-off point obtained when psychological wellbeing (i.e., GHQ-12) is mapped onto depression for the police sample in Study Three will be similar to the recommended cut-off point of 10/11 for the Australian population.

Research based on data that has been obtained through the National Survey of Mental Health and Wellbeing (NSMHW) has been used to establish a cut-off point for the GHQ-12 of 10/11 (Donath, 2001). If the cut-off point obtained in Study Three is similar to the Australian recommended cut-off point this indicates that the prevalence of depression can be inferred from psychological wellbeing scores, in the absence of direct work-related depression statistics.

Hypothesis 7. The cut-off point obtained when psychological distress (i.e., K10) is mapped onto depression for the police sample in Study Three will be similar to the recommended cut-off point of 30 for the Australian population.

A cut-off score of 30 on the K10 has been used to indicate the highest, most severe, level of distress (Australian Bureau of Statistics, 2003). Similar to Hypothesis 6a, if the cut-off point obtained in the police sample is similar to the Australian recommended cut-off point, this indicates that the prevalence of depression can be inferred from psychological distress scores, in the absence of direct work-related depression statistics.

2.7.1 Summary

In summary, this thesis will consist of three studies. The purpose of Study One: Cross-Sectional is to determine which of the DCS components are significantly related to context-free and job-specific specific measures of mental health (i.e., psychological wellbeing and job satisfaction). In addition to main effects, curvilinear and interaction effects of the DCS components will also be accounted for in light of previous research findings. The main effects of organisational justice (i.e., procedural, distributive, informational and interpersonal) will then be considered to determine whether organisational justice contributes unique variance to employee mental health. The P x D interaction effect will be tested for to determine whether the fair process effect is in action. The purpose of Study Two: Prospective is highly similar, although an additional two measures of context-free mental health will be included and the job-specific measure of job satisfaction omitted (due to lack of data). Study Three: Measurement Study focuses on the three context-free mental health measures (i.e., psychological wellbeing, psychological distress and depression) and seeks to determine whether the recommended cut-off points are accurate for estimating work related prevalence of depression in Australia.

CHAPTER 3: METHODS

In this chapter, the research design of this thesis will be presented, along with a description of the overall sample and the measurement scales utilised to obtain data. Further methodological details specific to each of the three studies will be presented in separate subsections within this chapter.

3.1 Research Design

Data for this thesis were collected as part of a larger project funded by the Australian Research Council (ARC) funded Linkage Project (LP0560340). The main purpose of the larger project is to examine the working conditions within a state-based police force in order to identify and develop the ways in which the organisation can more successfully achieve their strategic goals. The project uses a prospective cohort design. The prospective nature of the project enables researchers to more fully understand the impact of various work conditions, in the short term and long term, on employee health and attitudes.

This thesis is both cross-sectional and prospective. Study one uses cross-sectional data collected as part of the first survey in 2005. Study one aims to determine how work characteristics and organisational justice are related to a general mental health and job-related mental health, in the form of job satisfaction. Study two is prospective in nature and uses data collected in both 2005 and 2006. The aim of study two is similar to study one in that it also explores the relationships between work characteristics and organisational justice on mental health. In comparison to study one, study two includes a greater number of general mental health outcomes. Study two does not however contain a measure of job-related mental health

as this information was not available in 2006. Study three is cross-sectional in nature and uses data from the survey conducted in 2006 only. The aim of study three is dissimilar to study one and study two. The aim of study three was to explore the relationships between the three general mental health outcomes and to determine an optimal cut-off point for in order to allow an inference to be made in regards to the prevalence of work-related depression in Australia.

3.2 Procedure and Sample

Ethics approval was obtained from the Deakin University Human Research Ethics (DUHRE) and the Victorian police ethics committee prior to the commencement of the project. Surveys were distributed to sworn members (i.e, uniformed) and unsworn members (i.e., public servants) of the police force from different geographical regions across the Australian state under investigation. The surveys, entitled 'Employee Satisfaction and Wellbeing' (see Appendix A), were sent to a mail centre and were circulated to each work location from this central point. A cover letter and a reply-paid envelope accompanied each of the surveys (Appendix B). The cover letter informed participants of the nature of the survey, that participation was voluntary, and the expected time that the survey would take to fill out (approximately 30 minutes). Participants were also informed that the survey could be completed during work hours. In line with the *Commonwealth Privacy Act 1988*, police members were assured that the information they provided would only be disseminated to people immediately involved in the research. Further, they were advised that their individual responses would not be disclosed and only aggregated data would be reported in any work resulting from the information provided. The cover letter was signed by Christine Nixon (the former Chief Commissioner), Paul Mullet (the Secretary of The Police Association) and

Karen Batt (Branch Secretary for the Community and Public Sector Union) to demonstrate the organisation's support for the project. The name and contact details for a Research Assistant were provided to participants if they required further information. A prize coupon was also enclosed in the survey package and participants were given the opportunity to win one of 54 prizes if they chose to fill out the coupon with their details. Respondents were asked to put their completed prize coupon into a small envelope. Participants were asked to return the surveys in the sealed reply-paid envelopes to the researchers at Deakin University within a two week period. Reminders were sent out at 5 days and 10 days to ensure responses were received within this time. The envelopes containing the prize coupons were immediately separated from the survey responses once the survey packages were received by the researchers to protect the integrity of the data.

The first survey was sent in late 2005 (November/December) to employees of the state-based police force (n= 13, 596). Surveys were completed and returned by 4,644 members (sworn and unsworn), which is a response rate of 36%, to one of the primary researchers. The surveys were issued to employees in five geographical regions across the state. The present PhD project utilises the data from one particular region only. All of the employees within this region were sent surveys (n = 1,895). Approximately 36% of these employees returned the survey, resulting in a total of 690 completed surveys from this region. The majority of these returned surveys from this particular region were from sworn members (as opposed to unsworn members) of the police force (n=618). Sworn members of the police force are the focus of this thesis. The data collected from sworn respondents in the region of interest, in 2005, will be used in Study One and Study Two.

Members of the state-based police organisation were sent the second survey between October and November 2006. The number of sworn and unsworn respondents to the second survey (n=4,219) in 2006 was slightly less than the number returned in 2005. In contrast, slightly more employees returned the survey in 2006 (n=703) from the particular region under investigation in this project. For this region, a total of 162 employees provided their employee number in both the 2005 and 2006 surveys. Data from sworn respondents (n= 143) in 2006, from this particular region will be used in Study Two and Study Three. The demographic details for the samples for each of the three studies are provided in each of the forthcoming methodology sections.

3.3 Materials

The survey consisted of twenty one sections, including one demographic section and twenty other sections each referring to a particular measurement scale. Not all of the measurement scales in the survey will be utilised in this thesis.

The measurement scales were chosen for inclusion in the survey based on theoretical and methodological considerations. The work characteristics chosen for inclusion in this project were derived from the DCS model (Karasek, 1979; Karasek & Theorell, 1990). Sections A, B and C of the survey refer to the three DCS components. Existing instruments for each of these work conditions were compared by the project co-ordinators in terms of their psychometric reliability and validity in order to determine which scales were most suitable for inclusion in the survey. The social support instrument, for example, was selected because it assesses both work-based and non-work based social support (Etzion, 1984), whereas researchers have previously tended to measure only one source of social support, consequently

restricting their results. Section D of the survey refers to organisational justice. An instrument that contains of four separate fairness scales was included in the survey to account for four different types of organisational justice (Colquitt, 2001). The organisational justice scale was chosen because there has been a tendency within past organisational justice research to include a limited number of organisational justice types. Information was obtained on psychological wellbeing, psychological distress, depression and job satisfaction in sections K, M, O, Q of the survey. The specifics for each of the measurement scales used in studies one, two and/or three will now be discussed, separated by predictor variables and target variables.

3.3.1 Predictor Variables

3.3.1.2 Job Demand

Participants completed an 11 item measure of workload developed by Caplan et al. (1980) to assess job demand. This measure encompasses physical workload (i.e. how often does your job require you to work very fast?) and psychological workload (i.e. how much time do you have to think and contemplate?). The items were answered on a 5 point likert-type scale (1= 'very often' and 5= 'rarely'). To control for acquiescence, 6 of the items were worded in a negative direction. Overall workload was calculated by summing across all of the items (after reverse coding the negative items) and lower scores indicated higher levels of workload / job demand.

3.3.1.3 Job Control

A nine item scale developed by Karasek (1985) was used to measure participants' degree of job control. Participants were required to select the most appropriate answer for each item based on a five point likert-type scale (1= 'strongly disagree' to 5= 'strongly agree'). Two of the nine items was negatively worded and required recoding before overall job control was determined by summing scores on each of the items. Note that higher scores indicate increased job control.

3.3.1.4 Social Support

Respondents were required to indicate the extent to which they receive social support from both at work and outside of work on a seven point likert-type scale (1= 'very little' to 7= 'very much'). These two scales were developed by Etzion (1984). Seven of the 9 items require two answers (one for each scale), while a further two questions ask about work support and non-work support specifically. Scores on these two scales were summed to create an overall score for support at work, and an overall score for support outside of work. Higher scores on these scales indicate greater support.

3.3.1.5 Organisational Justice

Employees' perceptions of organisational justice were assessed with Colquitt's (2001) four justice scales, using a total of 20 items. Seven of the items pertain to procedural justice, four to distributive justice, another four to interpersonal justice and five to informational justice. Items were scored according to a five point Likert-type scale (1= 'very often' to 5= 'rarely'). Participants' scores on each scale indicate the extent to which they perceived each type of

organisational justice within their workplace. Higher scores on each scale were indicative of higher perceived justice.

3.3.2 Target Variables

3.3.2.1 Job Satisfaction

A 16-item scale was used to determine employees' perceived levels of job satisfaction (Warr et al., 1979). The items were measured on a seven point Likert-type scale (1= 'extremely satisfied' to 7='extremely dissatisfied') and high scores indicate high job satisfaction. The possible score range is between 16 and 112. All of the items on this scale are worded in the same direction; none of the items are negatively worded or require recoding.

3.3.2.2 Psychological Wellbeing

The General Health Questionnaire (GHQ)-12 (Goldberg & Williams, 1998) has tended to be the scale of choice for the assessment of mental health (Furukawa et al., 2003; Gill et al., 2007). This has been supported by a recent meta-analysis of high quality DC/S research that found that over half of the studies used the GHQ-12 to measure psychological wellbeing (Hausser, et al., 2010). The GHQ-12 has been shown to have strong psychometric validity in a range of working groups (Banks et al., 1980; Whaley et al., 2005). In the survey administered for this project, the GHQ-12 questions were presented to participants under the heading of "Wellbeing". The instrument consists of 12 items. Participants were asked to think about their general health in the preceding month and to indicate their response on a four point likert scale (0, 1, 2, 3), where 0 was 'much less than usual' and 3 was 'more so than usual'. Six of the items are worded in the negative direction in order to reduce the likelihood of acquiescence.

Prior to calculating an overall score for each participant, the negatively worded items were recoded. Items were then summed once all the items were worded in the same direction. The higher the overall score for the participant, the more positive their psychological wellbeing.

3.3.2.3 Psychological Distress

Psychological distress was assessed in the present project using the Kessler Psychological Distress Scale (K10), developed by Kessler and colleagues (2002). In the Australian NSMHW, the K10 has superseded the GHQ-12, in recent years, as the mental health measurement (ABS, 2003). The K10 consists of 10 items on a five point Likert scale (1= 'all of the time' to 5= 'none of the time'). The lowest score a participant can attain is 10 and the highest possible score is 50. The K10 questions were presented to participants under the heading of "Health" and they were asked to indicate how often they had experienced each indicator in the past 30 days. Higher scores are more indicative of psychological distress. In particular, scores greater than 30 have been suggested to indicate high or very high levels of psychological distress (ABS, 2003). All of the items on the K10 questionnaire are coded in the same direction.

3.3.2.4 Depression

In the present study, depression was measured using the shortened version (Santor & Coyne, 1997) of the Centre for Epidemiologic Studies– Depression Scale (Radloff, 1977). The depression items were presented to participants under the heading of "Mood" in the questionnaire, and participants were asked to endorse the response option that most accurately represented their feelings over the past week. The depression scale was not included in the

first survey in 2005. The shortened version of the CES-D consists of nine items. There are four response options for each item, ranging from 'rarely or none of the time' (scored as 0) to 'most or all of the time' (scored as 3). Two of the items are positively worded and required recoding before total scores could be calculated for each participant.

Information about each of the variables (predictor and target) included in this thesis are summarised in Table 1. An example item for each measurement scale, the total number of items in the scale, response options provided to respondents on the survey and the Cronbach's alpha is shown, where appropriate, for each of the three studies. As can be seen in the table, not all of the measurement scales were used in all of the three studies.

Table 1. Summary of Measurement Scales For Studies One, Two and Three

	Example Item	Total Items	Response Options	Cronbach'salpha
Job Demand	How often is there a great deal to be done?	11	(1) Very often (2) Fairly often (3) Sometimes (4) Occasionally (5) Rarely	Study One: .74 Study Two: .73
Job Control	I have a lot of say about what happens on my job	9	(1) Strongly disagree (2) Disagree (3) Neither (4) Agree (5) Strongly agree	Study One: .72 Study Two: .69
Social Support - Work	To what extent are you able to share the burden with others in terms of your duties and responsibilities?	10	(1) Very little (2) (3) (4) Moderate amount (5) (6) (7) Very much	Study One: .86 Study Two: .85
Social Support – Non work	To what extent do you get appreciation and recognition for what you do in your life outside work?	10	(1) Very little (2) (3) (4) Moderate amount (5) (6) (7) Very much	Study One: .88 Study Two: .86
Procedural Justice	To what extent have those procedures been applied consistently?	7	(1) Very often (2) (3) Sometimes (4) (5) Rarely	Study One: .84 Study Two: .82
Distributive Justice	Does your (outcome) reflect the effort you have put into your work?	4	(1) Very often (2) (3) Sometimes (4) (5) Rarely	Study One: .86 Study Two: .86
Interpersonal Justice	Has he/she treated you in a police manner?	4	(1) Very often (2) (3) Sometimes (4) (5) Rarely	Study One: .92 Study Two: .89
Informational Justice	Has he/she explained the procedures thoroughly?	5	(1) Very often (2) (3) Sometimes (4) (5) Rarely	Study One: .91 Study Two: .89
Job Satisfaction	Indicate how satisfied or dissatisfied you are with: The recognition you get for good work	16	(1) Extremely satisfied (2) Very satisfied (3) Moderately satisfied (4) Unsure (5) Moderately dissatisfied (6) Very dissatisfied (7) Extremely dissatisfied	Study One: .88
Psychological Wellbeing	Have you recently felt you couldn't overcome your difficulties?	12	(0) Much less than usual (1) Less than usual (2) Same as usual (3) More so than usual	Study One: .91 Study Two: .93 Study Three: .92
Psychological Distress	In the last 30 days, how often did you feel so nervous that nothing could calm you down?	10	(1) All of the time (2) Most of the time (3) Some of the time (4) A little of the time (5) None of the time	Study Two: .92 Study Three:.93
Depression	What most accurately represents your feelings in the past week: I felt that I could not shake off the blues even with the help from my family or friends	9	(0) Rarely or none of the time (1) Some or little of the time (2) Occasionally/moderate amount of time (3) Most or all of the time	Study Two: .94 Study Three: .93

3.4 Study One: Cross Sectional

3.4.1 Study Design and Procedure

The focus of the first study in this thesis is to explore how work characteristics and organisational justice contribute to mental health outcomes, namely, psychological wellbeing and job satisfaction. Study One is cross-sectional in nature and uses data collected from sworn police officers in 2005.

3.4.2 Participants

The following demographic information is based on 587 respondents, the number of cases prior to the exclusion of multivariate outliers specific to each of the target variables (i.e., psychological wellbeing and job satisfaction) under investigation in Study One. The respondents were aged as follows: 11.2% were 20-29 years, 31.7% were 30-39 years, 39.0% were 40-49 years, 17.5% were 50-59 years and 0.5% were aged 60 and over. Further, 77.5% of the participants were male and 22.5% were female. Of the total sample, 77.3% had completed secondary school education or higher (i.e., including secondary school, tertiary degree and postgraduate studies). In terms of tenure, 1.4% had worked for the police force for less than 12 months, while at the other extreme, 27.9% of the total sample had worked within the police force for more than 25 years.

Comparisons with personnel data were undertaken to determine the extent to which the sample was representative of all sworn members within the participating region. Breakdowns on the basis of age were not available, however according to the gender and tenure profiles of the region, study participants were not significantly different from the larger workforce (e.g., for gender, $\chi^2(1)=0.13$, *ns*).

3.4.2 Study One Instruments

In order to explore the influence of work characteristics (i.e., job demand, job control and social support) on employee mental health, three separate measures were used. *Job demand* was assessed using an 11 item measure that captures both physical and psychological workload and is scored on a 5 point (1= 'very often' and 5= 'rarely') likert-type scale (Caplan et al., 1980). *Job control* was measured with a nine item scale, developed by one of the DCS model founders (Karasek, 1985). Scores on this scale are scored on a five point likert-type scale (1= 'strongly disagree' to 5= 'strongly agree'). Finally, *social support*, from both within the workplace and outside the workplace was assessed through the use of 8 items, per type of social support, based on a seven point (1= 'very little' to 7= 'very much') likert-type scale (Etzion, 1984).

In addition to investigating the impact of work characteristics on mental health, this study builds on the DCS model and seeks to account for the organisational context through trying to determine how organisational justice is related to the mental health status of employees, and whether this effect, if any, is over and above the effect already accounted for by the work characteristics. *Organisational justice* was measured through the use of four separate fairness scales, with one scale for each type of organisational justice, all scored on a five point (1= 'very often' to 5= 'rarely') likert-type scale (Colquitt, 2001). Seven of the items pertain to procedural justice, four to distributive justice, another four to interpersonal justice and five to informational justice.

The impact of work characteristics and organisational justice was explored against two mental health outcomes. General mental health was assessed in the form of psychological wellbeing, while job-related mental health was assessed by way of job satisfaction. *Psychological wellbeing* was measured at the same time that work characteristic and organisational justice information was collected. A twelve item survey, named The General Health Questionnaire (GHQ)-12, was used to assess employee psychological wellbeing (Goldberg & Williams, 1998). Items on this scale were measured using a four point likert scale where 0 was 'much less than usual' and 3 was 'more so than usual'. Job-related mental health was measured through the use of a *job satisfaction* scale consisting of 16 items, measured on a seven point (1= 'extremely satisfied' to 7='extremely dissatisfied') likert type scale (Warr et al., 1979).

3.5 Study Two- Prospective

3.5.1 Study Design and Procedure

Similar to the first study in this thesis, the focus of Study Two is to examine how work characteristics and organisational justice contribute to the mental health of sworn police officers. In contrast to the first study, Study Two is prospective and uses survey data collected from participants in 2005 and 2006. For the purposes of conducting a prospective study data could only be used if it was possible to match the participant surveys in 2005 and 2006. The availability of matched data depended on whether the participants provided their employee number on both the first and second survey.

3.5.2 Participants

Matched data was available for 143 participants. Demographic data presented here for study two is based on the full 143 cases prior to the exclusion of cases with missing data. The majority of participants in the second study were Senior Constables (55.5%) and the majority were male (82.5%). In terms of tenure, 2.8% had worked for the police force for less than 12 months and 28% had been employed for more than 25 years. The ages of the participants at Time 1 were as follows; 9.1% were 20-29, 28.7% were 30-39, 44.1% were 40-49 and 18.2% were 50-59 years. Finally, 79.8% of the sample had completed secondary school or higher education.

3.5.3 Study Two Instruments

The instruments used in the second study to measure for the predictor variables were the same as the instruments used in the first study. In particular, the components of the DCS model were measured for using three separate scales. An 11 item measure for *job demand* (Caplan et al. 1980), a nine item measure for *job control* (Karasek, 1985) and an 11 item measure for *social support*, including both work and non-work based (Etzion, 1984). In order to determine whether organisational justice impacts on the mental health of employees over and above the influence attributed to work characteristics, four types of *organisational justice* predictors were accounted for using a 20 item measure of fairness (Colquitt, 2001). The same measure of organisational justice was included in the first study.

In contrast to the first study, which used one general mental health scale and one job-related mental health scale, scales for three general health measures were used in Study Two. Due to being prospective, the mental health data was collected in Study Two at one-year

follow-up. *Psychological wellbeing* was again measured using the GHQ-12 (Goldberg & Williams, 1998). *Psychological distress* was measured using the ten item K10 scale, with items scored on a five point (1= 'all of the time' to 5= 'none of the time') likert scale (Kessler et al., 2002). Finally, *Depression* was accounted for in this study using the nine item CES-D measure, with items scored between 0 and 3, where 0 is rarely and 3 is most or all of the time (Kohout et al., 1993; Radloff, 1977; Santor & Coyne, 1997).

3.6 Study Three- Measurement Study

3.6.1 Study Design and Procedure

The third study that forms this thesis will be conducted in order to explore the relationships between the three context-free mental health variables that are included as outcomes in the second study. In Study Three, the psychological wellbeing and psychological distress variables will be separately mapped onto the depression measure. An optimal cut-off point will be determined using statistical analyses for both the psychological wellbeing and the psychological distress measures. The two cut-off points obtained through analyses undertaken in this study of sworn police officers will be compared to the cut-off points reported in the literature for the general Australian population. Similarities in one or both of the cut-off points (i.e., from the police sample to the general population) will allow an inference to be made in regards to the prevalence of work-related depression in Australia.

3.6.2 Participants

The data for this study was drawn from the second survey, administered in late 2006. In total there were 631 respondents, both males (n = 479) and females (n=152) were included. According to the demographic data; the majority of the sample (42.9%) had been working for

the police force for more than 20 years at time of survey, although a substantial proportion (52.6%) had only been working in their current position for 1-4 years at time of survey. The most common rank was Senior Constable (57.8%) and the vast majority of the sample was employed on a full time basis (91.3%). The age breakdown of the sample was as follows; 11.9% 20-29 years; 30.6% 30-39 years; 38.8% 40-49 years; 18.5% 50-59 years; 0.2% 60 plus. Of the total sample, 42.8% had completed post-secondary school education.

3.6.3 Study Three Instruments

The focus of the third study in this thesis is the relationships between the general mental health outcomes. Consequently, work characteristics and organisational justice are not measured in Study Three, contrasting with the earlier studies in this thesis. Participant scores on a psychological wellbeing and a psychological distress scale will be mapped onto a measure of depression. *Psychological wellbeing* data was obtained in 2006 using the GHQ-12 scale (Goldberg & Williams, 1998). *Psychological distress* was measured using the ten item K10 scale, with items scored on a five point (1= 'all of the time' to 5= 'none of the time') likert scale (Kessler et al., 2002). The psychological wellbeing and psychological distress measures will be mapped onto *Depression*, as measured using a shortened version of the CES-D scale, with nine items scored between 0 and 3, where higher scores are indicative of poorer mental health (Kohout et al., 1993; Radloff, 1977; Santor & Coyne, 1997).

In summary, this methods chapter has described the background to this thesis project, particularly the research design of the broader ARC project and the overall sample from which the participants for this thesis have arisen. The research methods for the three studies that

comprise this thesis have been discussed in turn. In particular, the study design, procedure, participants and the instruments used in each of the studies have been described. In the first study, the capacity of work characteristics and organisational justice to influence the mental health of sworn police officers will be explored in terms of two outcomes, psychological wellbeing and job satisfaction. Building on Study One, the second study seeks to determine whether the effects of work characteristics and organisational justice, if any, persist at one-year follow-up. In the event that significant associations are found between the predictors and mental health outcomes in the second study, this result would provide support for a causal relationship, whereby work characteristics and/or organisational justice directly lead to the impairment/promotion of mental health. Rather than focusing solely on linear relationships between the predictors and mental health, the predictors will also be included in statistical analyses in the form of non-linear and interaction terms. The information gained from the first two studies in this thesis will add to a growing body of empirical research as to how work characteristics and organisational justice are related to mental health, particularly in terms of sworn police officers. Further, the information acquired from Study Three may provide information as to the prevalence of work-related depression in the Australian population.

CHAPTER 4: RESULTS

4.1 Study One- Cross Sectional

4.1.2 Data Preparation for Study One

Participant item scores for each of the measurement scales of interest (i.e., the three DCS variables, organisational justice, psychological wellbeing and job satisfaction) were summed to create total scores for each of the scales, ensuring that any negatively worded items were re-coded prior to the calculation of the sums. The data was screened for input errors/accuracy of data entry, missing values and outliers. No out of range values were identified. The check for missing values and the pattern of missing data was conducted using the NMISS command in SPSS Transform, with the data separated by measurement scales. Cases that were missing data on more than one third of a particular scale were removed from further analyses due to the missing data being in a non-random pattern. Data that is missing in a non-random pattern (i.e., refusing to answer items on a particular scale) can affect the generalisability of results if these cases are retained in further analyses (Tabachnick & Fiddell, 1996). Inspection of cases revealed that one case was missing all job control data, a further case was missing substantial job demand data, two cases were missing substantial work-based support data, two cases were missing all job satisfaction data and twenty-three cases were missing substantial, if not all, data on the organisational justice scales.

Following the check for non-random missing data, preliminary standard regressions were run to check for the presence of outliers. Outlying cases were identified using a Mahalanobis Distance of X^2 (8) = 26.125 ($p<.001$), a critical value of 26.125 based on 8

predictors (Tabachnick & Fiddell, 1996). Two cases were identified as outliers and were consequently deleted, leaving n=587 cases for further analysis.

Skewness equations were derived for each of the variables of interest, by dividing the Skew value by the Standard Error of Skew value provided by SPSS Descriptives (Tabachnick & Fiddell, 1996). Based on the results of the skewness equations, three of the predictor variables initially appeared to be skewed, namely job control (skew= -6.53), non-work support (skew= -5.22) and interpersonal justice (skew= -5.01). Further, the psychological wellbeing and job satisfaction target variables appeared to be skewed (skew= -11.42 and skew= -5.08 respectively). In order to determine whether or not any of these variables needed to genuinely be transformed before inclusion in further analyses, a test transformation was conducted on each of these variables using reflect and square root, the most appropriate transformation for these particular distributions (Pallant, 2005). Standard multiple regressions were conducted using SPSS for each variable, first by regressing the untransformed variable and then the transformed variables onto each of the two target variables (psychological wellbeing and job satisfaction). Upon inspection of the results for each of the standard multiple regressions for each variable (untransformed and transformed), job control was the only variable that needed to genuinely be transformed before further analyses were conducted. In particular, it was revealed that job control needed to be transformed before inclusion in the hierarchical regression analysis onto psychological wellbeing, but not the hierarchical regression analysis onto job satisfaction.

Preliminary hierarchical regressions were conducted for both psychological wellbeing (using transformed control) and job satisfaction (using all untransformed predictor variables). Each of the hierarchical regression analyses consisted of linear, squared and interaction terms,

resulting in 24 predictors in total. Prior to the creation of the squared and interaction terms, the seven predictor variables (i.e., job demand, job control, work-support, non-work support, procedural, distributive, interpersonal and informational justice) needed to be "centered". Centering is a statistical process whereby the means for each variable becomes zero and each participant's score is a deviation from this new mean (Aiken & West, 1991). It is necessary to centre variables before creating squared or interaction terms otherwise there is a greater risk of multicollinearity (Tabachnick & Fiddell, 1996).

The work characteristics of the DCS model were entered into the first step of the hierarchical regression to test for linear effects. The squared (i.e., non-linear) work characteristics were entered into the second step to test for curvilinear effects and the two-way and three-way DCS interaction terms were entered into the third and fourth steps respectively. Each of the four types of organisational justice (i.e., distributive, procedural, informational, interpersonal) were entered into the fifth step of the hierarchical regression to test for linear effects. The squared (i.e., curvilinear) terms for each type of organisational justice was entered into the sixth step. Finally, one two-way organisational justice interaction term was entered into the seventh step of the analysis. A check was then conducted for outliers based on the recommended Mahalanobis Distance, X^2 (24) = 51.179 ($p<.001$) for 24 predictor terms (Tabachnick & Fiddell, 1996). According to the hierarchical regression for psychological wellbeing, 41 cases exceeded the critical value and were consequently removed from further analysis, resulting in n=546 for the final analysis for psychological wellbeing. The hierarchical regression for job satisfaction indicated that 32 cases exceeded the critical value for Mahalanobis Distance and were therefore removed from the data set, resulting in n=555 for inclusion in the final job satisfaction analysis. Although cases have been removed from

further analysis for both of the target variables, the sample sizes for both of these regression equations is adequate based on the equation $N \geq 50 + 8(m)$, where m is the number of predictor variables (Tabachnick & Fiddell, 1996).

Table 2 summarizes the means and standard deviations for each variable, as well as Pearson's correlations between the study variables. Multicollinearity was not deemed to be an issue due to the correlations between the predictor variables being less than .09 (Pallant, 2005). In terms of the work characteristics and the target variables, job demand had a small to moderate significant negative correlation with psychological wellbeing and job satisfaction. Job control and work-based support were both correlated to psychological wellbeing and job satisfaction, although these associations were relatively small for wellbeing (r= .168 and r=.370 respectively) compared to job satisfaction (r=.468 and r=.658 respectively). Non-work based social support had a small to moderate positive correlation with psychological wellbeing and job satisfaction. All four types of organisational justice were significantly correlated with psychological wellbeing and job satisfaction. Finally, the correlation between the two outcome measures (job satisfaction and psychological wellbeing) was significant.

Table 2.Correlations Between Job Control, Job Demand, Social Support, Organisational Justice, Psychological Wellbeing and Job Satisfaction

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1. Job Control	31.78	4.47									
2. Workload	39.12	5.02	.065								
3. Support at Work	39.03	9.73	.296**	-.258**							
4. Support Outside Work	47.72	9.73	.119**	-.086*	.508**						
5. Procedural Justice	16.07	5.22	.229**	-.096*	.423**	.253**					
6. Distributive Justice	9.48	4.00	.098	-.241**	.362**	.163**	.522**				
7. Interpersonal Justice	13.65	3.79	.301**	-.022	.360**	.150**	.469**	.337**			
8. Informational Justice	14.43	4.80	.269**	-.079	.426**	.169**	.550**	.426**	.703**		
9. Psychological Wellbeing	22.64	6.24	.168**	-.295**	.370**	.236**	.181**	.146**	.180**	.226**	
10. Job Satisfaction	68.55	13.63	.468**	-.297**	.658**	.292**	.491**	.485**	.432**	.508**	.452**

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

Although the DCS variables and organisational justice were both significantly correlated with the mental health target variables, it is not possible to compare their relative importance or determine whether organisational justice contributes to employee mental health over and above the three work characteristics. Consequently, hierarchical regression analyses, which compare the predictive capacity of predictor variables, were undertaken for each of the target variables.

Two separate hierarchical multiple regressions were conducted to assess the independent contributions made by the DCS and organisational justice variables onto context-free and job-specific mental health, as measured by psychological wellbeing and job satisfaction. The full results of the hierarchical regression analyses are presented in Table 3.

Table 3 Summary of Cross-Sectional Hierarchical Regression Analysis for Variables Predicting Psychological Wellbeing and Job Satisfaction

	Psychological Wellbeing			*Job Satisfaction*		
	B	SE B	*β*	*B*	SE B	*β*
Step 1						
Job Demand	-.216	.066	-.163**	-.523	.099	-.190***
Job Control	-.857	.469	-.091	.816	.117	.252***
Support at Work	.126	.040	.186**	.536	.061	.374***
Support Outside Work	.054	.036	.082	-.059	.054	-.042
Δ R^2			.132			.478
Step 2						
Job Demand^2	-.019	.011	-.085	-.007	.017	-.016
Job Control ^{2}	-.022	.014	-.079	.019	.022	.032
Support at Work^2	.002	.003	.028	.002	.005	.016
Support Outside Work^2	.000	.003	.004	-.007	.004	-.063
Δ R^2			.010			.004
Step 3						
Job Control x Job Demand	.027	.017	.080	.043	.024	.067
Job Control x Support at Work	.038	.011	.211***	-.018	.016	-.050
Job Control x Support Outside Work	-.013	.009	-.074	.002	.014	.005
Job Demand x Support at Work	.010	.010	.062	-.012	.014	-.034
Job Demand x Support Outside Work	-.008	.008	-.054	.009	.011	.029
Δ R^2			.030			.005
Step 4						
Job Control x Job Demand x Support at Work	.000	.002	-.010	.002	.003	.020
Job Control x Job Demand x Support Outside Work	.002	.002	.037	-.001	.003	-.013
Δ R^2			.001			.000
Step 5						
Procedural Justice	.004	.074	.003	.148	.113	.057
Distributive Justice	-.113	.092	-.071	.638	.139	.192***
Interpersonal Justice	.008	.110	.005	.328	.167	.092*
Informational Justice	.093	.091	.069	.379	.140	.132**
Δ R^2			.007			.093
Step 6						
Procedural Justice^2	-.020	.014	-.095	-.016	.021	-.035
Distributive Justice^2	-.006	.024	-.015	-.058	.033	-.074
Interpersonal Justice^2	.006	.020	.018	.057	.030	.078
Informational Justice^2	-.005	.013	-.021	-.019	.020	-.037
Δ R^2			.007			.004
Step 7						
Procedural Justice x Distributive Justice	.006	.025	.019	.071	.036	.109*
Δ R^2			.000			.004

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

The overall equations for both of the hierarchical multiple regressions were significant, indicating that the models explain significant variance for psychological wellbeing, R^2_{adj} = .139, F(24, 407) = 3.893, p < .001 and job satisfaction, R^2_{adj} = 0.564, F(24, 402) = 23.961, p < .001. According to the results, the DCS variables captured the majority of variance for both mental health outcome measures.

Job demand and work-based social support were significantly related to psychological wellbeing. In particular, high levels of job demand were related to poor psychological wellbeing, whereas a high level of work-based social support was related to positive psychological wellbeing. Job demand and work-based social support together explained 13.2% of the variance in psychological wellbeing. The two-way interaction between job control and work-based social support was significantly related to psychological wellbeing and explained a further 3% of variance. The organisational justice dimensions failed to account for additional variance over and above the variance already accounted for by the main effects and two-way interaction effect of the DCS variables in regards to the psychological wellbeing outcome. There was no evidence of curvilinear effects for either the DCS or the organisational justice variables.

In addition to psychological wellbeing, job demand and work-based social support were also significantly related to the job satisfaction outcome. The associations between job demand and work-based social support onto job satisfaction were stronger compared to when they were regressed against psychological wellbeing. Further, job control and job satisfaction were significantly related, with the direction of relationship indicating that higher levels of job control or employee autonomy are associated with positive levels of job satisfaction. Social support from outside the workplace did not reach significance. The three DCS variables that

did reach significant however, explained 47.8% of the variance in job satisfaction. None of the curvilinear, two- or three-way DCS interactions were associated with job satisfaction. In terms of organisational justice, three of the four organisational justice terms (i.e., distributive, interpersonal and informational justice) were significantly related to job satisfaction, with a further 9.3% of variance accounted for over and above the variance already explained by the work characteristics. Although procedural justice did not exhibit a main effect on job satisfaction, the two-way interaction between procedural justice and distributive justice was significant. There was no evidence of curvilinear relationships.

In summary, job demand was significantly related to both psychological wellbeing and job satisfaction. Job control was significantly related to job satisfaction but did not demonstrate a main effect with psychological wellbeing. Work-based social support was significantly related to both psychological wellbeing and job satisfaction, whereas social support provided from outside the workplace was not significantly related to either mental health outcome. A significant DCS interaction was found for psychological wellbeing. Organisational justice contributed additional variance to job satisfaction over and above the variance already captured in the form of three main effects of organisational justice and a significant two-way interaction between procedural and distributive justice. None of the curvilinear terms (i.e., DCS or organisational justice variables) reached significance for either outcome.

4.2 Study Two- Prospective

4.2.1 Data Preparation for Study Two

A total of 143 respondents provided their employee numbers on the first and second surveys, meaning that their data could be matched across the two waves of data collection. The NMISS function in SPSS was used to identify whether there were any cases with missing data and to determine whether there was a pattern to any missing data (e.g. avoiding answering questions within one scale). Analysis of the data revealed that two cases were missing all responses on organisational justice, a further case was missing substantial data on interpersonal and informational justice and a fourth case was missing more than half of responses on distributive justice. These four cases were removed from further data analysis resulting in a total of 139 cases. Eight cases were missing all of the responses for the depression scale. These particular cases were coded as '99' so that they would be excluded from the hierarchical multiple regression onto depression (i.e., leaving n=131 for depression), while ensuring they would be retained in the other two regressions onto psychological wellbeing and psychological distress.

New sums were created for each variable (i.e., job controlt1, job demandt1, support at workt1, support outside workt1, procedural justicet1, distributive justicet1, interpersonal justicet1, informational justicet1, psychological wellbeingt1, psychological wellbeingt2, psychological distresst2 and depressiont2) using SPSS, ensuring that the items used to create the sums for each scale were coded in the same direction. For example, for job control items 1,3,4,5,7,8 and 9 were originally worded in the positive direction, whereas items 2 and 6 were originally worded in the negative direction, therefore items 2 and 6 were recoded into the positive direction to match the other items within the scale prior to the sum being created.

The variables that were to be used as predictors in the regression analyses had to be centered in order to create the curvilinear and interaction terms. In order to centre the variables, the means for each variable had to first be calculated, with the means depending on the number of cases in each regression analyses. The cases for the psychological wellbeing and psychological distress analyses were the same and could use the same centered variables, whereas depression had fewer cases due to the eight cases missing all depression data previously discussed and therefore, centering for depression had to be done separately. Once the variables were centered, it was possible to create the interaction terms required for the hierarchical analyses to investigate the possibility of curvilinear or interaction effects. The skewness statistics were then calculated. The following variables were identified as being potentially skewed; psychological wellbeing at time one, psychological wellbeing at time two, distributive justice and psychological distress. Trial transformations were conducted for the variables of interest, using reflect and square root (Pallant, 2005). In order to determine whether any of the transformed variables needed to be retained for further analyses, in place of the original (i.e., untransformed variables), standard regressions were conducted, whereby the predictor variables were regressed onto the transformed variable and onto the untransformed variable. The same predictor variables remained significant, with no additional predictors reaching significance in one standard regression and not the other, for all of the variables of interest except for psychological distress. For psychological distress, a comparison of the standard regression results indicated that the transformed variable, rather than the original untransformed variable, needed to be retained for analysis. Prior to the hierarchical regression analyses being conducted, the Pearson's correlations between the study variables of interest were calculated. The means, standard deviations and correlation

coefficients are presented in Table 4. Job demand (time one) was significantly correlated with psychological wellbeing, psychological distress and depression in the expected directions. Social support from within the workplace (time one) also shared significant associations with the three mental health outcomes, however, the relationships between social support and the outcomes was not as strong as the relationships between job demand and the mental health outcomes. The associations between social support (time one) and psychological wellbeing, distress and depression (time two) were in the expected directions, whereby higher levels of social support were linked to a more positive mental health status. Distributive justice (time one) had a weak, but significant, association with psychological wellbeing as measured at time two. Psychological wellbeing at time one shared a moderately strong correlation with all three time two measures of mental health. The associations between the three mental health outcomes at time two were strong, particularly between psychological wellbeing and depression (r= -.847) and psychological distress and depression (r= -.841).

Table 4 Correlations Between Job Control, Job Demand, Social Support, Organisational Justice, Psychological Wellbeing, Psychological Distress and Depression

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Job Controlt1	31.40	4.24											
2. Job Demandst1	38.67	5.07	.074										
3. Support at Workt1	38.45	9.65	.196*	-.231**									
4. Support Outside Workt1	50.72	9.76	.014	-.114	.225**								
5. Procedural Justicet1	25.86	5.33	-.315**	.030	-.339**	.032							
6. Distributive Justicet1	14.47	4.05	-.123	.280**	-.230**	.060	.424**						
7. Interpersonal Justicet1	10.24	3.48	-.233**	-.066	-.243**	.001	.391**	.206*					
8. Informational Justicet1	15.60	4.73	-.210**	.017	-.344**	.039	.469**	.261**	.682**				
9. Wellbeingt1	22.31	6.30	.074	-.337**	.277**	.136	-.069	-.041	.031	-.044			
10. Wellbeingt2	21.86	7.11	.040	-.345**	.192*	.126	-.055	-.174*	-.054	-.165	.537**		
11. Psychological Distresst2	41.76	7.58	.056	-.318**	.262**	.134	-.140	-.082	-.007	-.120	.517**	.797**	
12. Depressiont2	8.02	6.82	-.062	.340**	-.242**	-.132	.102	.114	.029	.112	-.548**	-.847**	-.841**

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

Three hierarchical multiple regressions were conducted, one for each mental health outcome. The entry of predictor variables in this study is identical to the cross-sectional study except for the addition of psychological wellbeing at time one, which was entered prior to the addition of all other predictors. Psychological wellbeing was entered in the first step for all three analyses as a measure of baseline mental health. Time one psychological distress and depression data were not available for use as control measures. Following psychological wellbeing at time one, the original (i.e., uncentered) DCS variables were entered into the hierarchical regressions, followed by the squared DCS variables (i..e, centered control x centered control), the two-way DCS interactions (i.e., centered control x centered job demand) in the fourth step and the three way DCS interactions (i.e., centered control x centered workload x centered support at work) in the fifth step. The four types of organisational justice were entered into the sixth block, followed by the squared justice terms (i.e., centered procedural justice x centered procedural justice) in the seventh step, and finally, the eighth step included the sole two-way justice interaction term (i.e., centered procedural justice x centered distributive justice).

The results of the hierarchical regression analyses (see Table 5) found that psychological wellbeing at time one was significantly related to psychological wellbeing, psychological distress and depression all measured at follow-up. Job demand was significantly related to both psychological wellbeing and psychological distress at follow-up, it did not reach significance for depression. Resources at the job level in the form of job control and social support did not reach significance. Nevertheless, after controlling for mental health at baseline and after the addition of the DCS variables in the second step, 3.3% of variance in

psychological wellbeing, 4.7% of variance in psychological distress and 2.7% of variance in depression was accounted for. One of the three-way DCS interaction effects (job control by job demand by social support at work) was significantly related to psychological wellbeing at follow-up and accounted for 3% of variance. This significant result indicates a buffering effect between the levels of these particular DCS variables when regressed onto psychological wellbeing. Resources at the organisational level in the form of organisational justice were not significantly related to any of the outcome measures. There was no evidence of curvilinear or interaction effects for any of the predictors onto any of the context-free mental health outcome variables.

Table 5. Summary of Prospective Hierarchical Regression Analysis for Variables Predicting Psychological Wellbeing, Psychological Distress and Depression

	Psychological Wellbeing T2			Psychological DistressT2			DepressionT2		
	B	SE B	β	B	SE B	β	B	SE B	β
Step 1									
Psychological Wellbeing t1	.582	.096	.516**	-.087	.016	-.454***	-.557	.099	-.523***
Δ R^2			.288			.029			.300
Step 2									
Job Controlt1	.044	.144	.026	-.009	.025	-.031	-.097	.146	-.061
Job Demandst1	-.248	.125	-.177*	.049	.021	.206*	.218	.134	.159
Support at Workt1	-.012	.069	-.016	-.015	.012	-.120	-.060	.070	-.086
Support Outside Workt1	-.004	.061	-.005	-.004	.010	-.033	.014	.061	.021
Δ R^2			.033			.047			.027
Step 3									
Controlt1²	.008	.026	.026	-.001	.004	-.027	-.026	.026	-.095
Demandt1²	.014	.020	.063	-.004	.003	-.119	-.003	.021	-.012
Support at workt1²	.000	.005	-.006	.001	.001	.076	.005	.005	.090
Support outside workt1²	-.006	.004	-.127	.001	.001	.127	.002	.004	.055
Δ R^2			.013			.024			.016
Step 4									
Job Controlt1 x Job Demandst1	.017	.029	.055	-.004	.005	-.083	-.015	.030	-.051
Job Controlt1 x Support at Workt1	-.012	.015	-.068	-.001	.003	-.024	.018	.016	.105
Job Controlt1 x Support Outside Workt1	-.004	.016	-.023	.001	.003	.036	.008	.016	.045
Job Demands t1 x Support at Workt1	-.012	.016	-.071	.001	.003	.051	.008	.016	.049
Job Demandst1 x Support Outside Workt1	.006	.012	.042	.001	.002	.042	-.005	.012	-.041
Δ R^2			.009			.003			.007
Step 5									
Job Controlt1 x Job Demandst1 x Support at Workt1	.009	.004	.216*	-.001	.001	-.189	-.008	.004	-.205
Job Controlt1 x Job Demandst1 x Support Outside Workt1	.002	.003	.067	.000	.000	.018	-.002	.003	-.084
Δ R^2			.030			.019			.026
Step 6									
Procedural Justicet1	.210	.138	.157	.007	.024	.032	-.103	.138	-.082
Distributive Justicet1	-.205	.168	-.117	-.021	.029	-.070	-.002	.172	-.001
Interpersonal Justicet1	.077	.231	.038	-.023	.040	-.067	-.021	.226	-.011
Informational Justicet1	-.310	.166	-.206	.027	.028	.107	.129	.165	.090
Δ R^2			.034			.011			.004
Step 7									
Procedural Justice²t1	.015	.020	.076	-.001	.003	-.038	-.027	.020	-.145
Distributive Justice²t1	.008	.032	.022	.002	.005	.033	-.004	.032	-.013
Interpersonal Justice²t1	-.006	.051	-.013	-.001	.009	-.014	-.018	.050	-.042
Informational Justice²t1	.018	.025	.072	-.002	.004	-.059	.002	.026	.008
Δ R^2			.007			.007			.021
Step 8									
Procedural x Distributive Justicet1	-.015	.036	-.043	-.002	.006	-.036	-.007	.036	-.021
Δ R^2			.001			.001			.000

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

4.3 Study Three- Measurement Study

4.3.1 Data Preparation for Study Three

Data analyses were conducted using version 15.0.1 of SPSS and Microsoft Excel. Receiver operating characteristic (ROC) curves were generated for the GHQ-12 and the K10 onto depression for the total sample, as well as by sex (per Donath, 2001). These analyses resulted in a total of six curves and associated statistics. ROC curves stem from signal detection theory (Peterson, Birdsall, & Fox, 1954) and are used to depict the accuracy with which a test discriminates between two alternatives, such as diseased or non-diseased (Fawcett, 2006; Peterson, et al., 1954). ROC curve analysis seeks to maximize the chances of making a correct prediction or 'hit', while minimizing the number of 'misses' (Peterson, et al., 1954; Swets, 1988). The number of 'hits' or true-positive (TP) decisions are plotted on the y-axis, against the number of 'misses' or false-positive (FP) decisions on the x-axis, with each point on the curve referring to a particular sensitivity (TP) and specificity (FP) value (Akobeng, 2007; Fawcett, 2006; Peterson, et al., 1954). ROC curves that are no more accurate than chance have an area under the curve (AUC) of .50, while curves with perfect accuracy have an AUC of 1.00 (Fawcett, 2006; Peterson, et al., 1954). Sensitivity and specificity values can be used to calculate the Youden index = $\max_t$ [sensitivity(t) + specificity(t)], which identifies the optimal cut-off point for a test, or point at which the ROC curve is farthest from the chance line on the diagonal (Fluss, Faraggi, & Reiser, 2006; Hsieh & Turnbull, 1996). Provided that the accuracy of the curve is reasonably high, the cut-off point can then be determined based on the sensitivity and specificity values for the various points of the curve. Sensitivity and specificity by default have the same weighting (1:1) in the Youden index

(Hsieh & Turnbull, 1996), however, these weightings can be adjusted. For example, if it is more important to identify positive cases (e.g., depression) sensitivity values could be given greater weight, but this weighting creates more false-positive diagnoses (Peterson, et al., 1954; Santor & Coyne, 1997). False-positive diagnoses can result in unnecessary shock to the individual and may result in inappropriate treatment and needless use of resources and the reverse situation is also applicable where a false-negative diagnosis may mean that an individual may not receive treatment because their illness is unrecognized (Youden, 1950). The task is to find the cut-off point, or threshold value, at which the trade-off between sensitivity and specificity is most appropriate for the phenomenon under investigation (Akobeng, 2007).

Based on the CES-D (Iowa) scale, 65.6% of the sample in the present study (n = 414) was classified as depressed, scoring four or more (Santor & Coyne, 1997). The mean score on the CES-D (Iowa) was 7.56 (95% CI = 7.06 – 8.07). Testing the boundary score using the highest cut-off point considered for the CES-D (Iowa) (Santor & Coyne, 1997), a score of nine, resulted in 37.2% of the present sample (n = 235) being classified as depressed.

For the overall sample, the mean of the GHQ-12 was 13.63 (95% CI = 13.10 – 14.14), with mean scores of 13.75 for males and 13.24 for females. The mean score on the K10 for the overall sample was 17.91 (95% CI = 3.48 – 32.34), with mean scores of 17.98 for males and 17.70 for females. The AUC values and their respective 95% confidence intervals for each of the three samples are in Table 6.

Table 6. Area under the curve (AUC) comparison for General Health Questionnaire (GHQ-12) and Kessler psychological distress scale (K10)

	GHQ-12 (95% CI)	**K-10 (95% CI)**
Total Sample	.89 (.86 - .91)	.91 (.89 - .93)
Males	.90 (.87 - .92)	.92 (.89 - .94)
Females	.87 (.82 - .93)	.89 (.83 - .94)

The cut-off points for both the GHQ-12 and the K10 were identified through the calculation of the Youden index (Hsieh & Turnbull, 1996). The sensitivity and specificity values for each of the cut-off points respectively are presented in Table 7. For the present study, the cut-off point for the overall sample was calculated to be 11.5 for the GHQ-12 and 15.5 for the K10 (emphasized in bold font).

Table 7. Sensitivity and specificity values for different cut-off points on the General Health Questionnaire (GHQ-12) and Kessler psychological distress scale (K10) for the overall sample (excluding latter values where specificity equals 1)

GHQ-12			**K10**		
Cut-off	Sensitivity	Specificity	Cut-off	Sensitivity	Specificity
1	1	0	9	1	0
2.5	1	0.9	10.5	99.8	22.6
3.5	99.8	1.8	11.5	97.1	37.3
4.5	99.8	2.3	12.5	92.9	59.9
5.5	99.5	6.0	13.5	89.2	73.7
6.5	98.8	19.4	14.5	82.4	82.0
7.5	97.8	33.2	**15.5**	**74.3**	**90.8**
8.5	95.1	49.3	16.5	68.2	93.1
9.5	90.7	61.8	17.5	61.6	97.2
10.5	84.6	76.5	18.5	54.2	99.1
11.5	**75.6**	**86.6**	19.5	48.7	99.5
12.5	65.8	92.2	20.5	42.3	99.5
13.5	56.0	96.0	21.5	36.0	99.5
14.5	50.1	97.2			
15.5	41.6	97.7			
16.5	36.2	98.6			
17.5	33.0	99.1			

In addition to calculating the above cut-off points based on a 1:1 ratio, the sensitivity and specificity values were given differential weightings to check the effects this would have on the cut-off points identified above (see Table 8). These checks were done for the overall sample, and for males and females respectively, in order to identify any gender differences in the cut-off points.

Table 8: Cut-off points for the General Health Questionnaire (GHQ-12) and Kessler psychological distress scale (K10) for men, women and the overall sample using differential sensitivity and specificity weightings

	Men	**Women**	**Overall Sample**
GHQ-12			
1:1	11.5	10.5	11.5
1:2	12.5	14.5	12.5
2:1	10.5	10.5	10.5
K10			
1:1	15.5	14.5	15.5
1:2	17.5	15.5	15.5
2:1	13.5	13.5	13.5

Note: 1:1 sensitivity and specificity have an equal weighting; 1:2 specificity (FP) a greater weighting; 2:1 sensitivity (TP) has a greater weighting.

Relative to the default 1:1 weighting, the cut-off points for both the GHQ-12 and the K10 scales tended to increase when specificity (FP rate) was given twice the weighting of

sensitivity (TP rate) under the 1:2 weighting condition. Further, an inspection of the 1:1 weighting condition compared to the 2:1 weighting condition revealed that the cut-off points tended to decrease slightly when sensitivity was given twice the weighting of specificity. The pattern of relative increases in cut-off points for the overall sample when specificity was given more weight, and the relative decreases in the cut-off points when sensitivity was given more weight, were in the expected directions (Peterson, et al., 1954).

Males and the overall sample shared identical cut-off points for both the GHQ-12 and the K10 in all instances, except when specificity (FP rate) was given greater weighting on the K10. The cut-off points for the female sample differed from the cut-off points for the overall sample for the 1:1 and 1:2 weightings. However, under the 2:1 weighting condition, the cut-off points for males, females and the overall sample were identical for both the GHQ-12 and the K10 (10.5 and 13.5 respectively). The cut-off point of 11.5 obtained for psychological wellbeing (i.e., on the GHQ-12) is similar to the recommended cut-off point obtained for the broader Australian population (10/11) and indicates that the point at which Australians tend to experience poor psychological wellbeing is also the point at which depression becomes likely. The cut-off point of 15.5 obtained for psychological distress (i.e., on the K10) was substantially lower than the recommended cut-off point for the Australian population (i.e., 30 and above) and perhaps indicates that individuals who are suffering from moderate to very high levels of psychological distress, rather than simply ‘very high’ distress are at risk of depression.

4.4 Results Summary

In this section, the significant results for this thesis are summarised and the original hypotheses that were presented in section 2.7 are presented (see Table 9) to demonstrate whether they were accepted or rejected.

1) Job demands and support at work were significantly related to psychological wellbeing at baseline in the expected directions. Higher job demands were related to poor psychological wellbeing, whereas higher social support from within the workplace was related to more positive psychological wellbeing.
2) The two-way interaction between job control and social support at work was significantly related to psychological wellbeing. The direction of this result indicates that positive levels of job control and social support together contribute to psychological wellbeing
3) Job demands, job control and social support at work were all significantly related to job satisfaction in the expected directions. Higher demands were related to poorer job satisfaction, whereas higher job control and/or social support were related to greater job satisfaction.
4) Distributive justice, interpersonal justice and informational justice were significantly related to job satisfaction over and above the DCS variables.
5) The two-way procedural by distributive justice interaction was significantly related to job satisfaction. This result indicates that the level of procedural justice can off-set the level of distributive justice and contribute to positive job satisfaction.

6) Baseline psychological wellbeing is significantly related to mental health at follow-up (i.e. psychological wellbeing, distress and depression).
7) High levels of job demands were associated with poor psychological wellbeing.
8) The three-way job control by job demand by social support at work interaction was significantly related to psychological wellbeing at follow-up.
9) Job demands were related to psychological distress, whereby high levels of job demands were associated with greater psychological distress at follow-up.
10) The obtained cut-off point for psychological wellbeing is highly similar to the recommended cut-off point for Australians. This result suggests that the point at which Australians tend to experience poor psychological wellbeing may also be the point at which depression becomes likely.

Table 9. Summary of Hypotheses and Results

Hypotheses	Accepted or Rejected	Remark
Hypothesis 1a. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of context-free mental health (i.e., psychological wellbeing) at one point in time.	Partially accepted	Job demand and work-based social support were significant predictors of psychological wellbeing.
Hypothesis 1b. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of context-free mental health (i.e., psychological wellbeing, psychological distress and depression) across a period of one year.	Partially accepted	Job demands significantly related to psychological wellbeing and distress at follow up.
Hypothesis 2. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of job-specific mental health (i.e., job satisfaction) at one point in time.	Partially accepted	Job demand, job control and work-based support significant. Non-work based support not related.
Hypothesis 3a. The work characteristics of the DCS model (i.e., job demand, job control and social support) will demonstrate a non-linear and/or interaction effect with the mental health outcomes (i.e., psychological wellbeing and/or job satisfaction) at one point in time.	Partially accepted	No evidence for curvilinear effects. Two-way job control x work-based support significant onto wellbeing.
Hypothesis 3b. The work characteristics of the DCS model (i.e., job demand, job control and social support) will demonstrate a non-linear and/or interaction effect with the mental health outcomes (i.e., psychological wellbeing and/or psychological distress and/or depression) across a period of one year.	Partially accepted	No evidence for curvilinear effects. Three-way job control x job demands x work-based support significantly related to wellbeing
Hypothesis 4a. Organisational justice will contribute unique variance to employee mental health (i.e., psychological wellbeing and/or job satisfaction) over-and-above the variance attributed to the components of the DCS model at one point in time.	Partially accepted	Three types of justice significantly related to job satisfaction.
Hypothesis 4b. Organisational justice will contribute unique variance to employee mental health (i.e., psychological wellbeing, psychological distress and depression) over-and-above the variance attributed to the components of the DCS model across a period of one year.	Rejected	No evidence for justice contributing variance above DCS components at follow up.
Hypothesis 5a. The procedural justice by distributive justice (P x D) interaction effect will be significantly related to mental health (i.e., psychological wellbeing and/or job satisfaction) at one point in time.	Partially accepted	Fair process effect evident for job satisfaction. Not related to psychological wellbeing.
Hypothesis 5b. The procedural justice by distributive justice (P x D) interaction effect will be significantly related to mental health (i.e., psychological wellbeing, psychological distress and depression) across a period of one year.	Rejected	No evidence of fair process effect at follow up onto context free mental health.
Hypothesis 6. The cut-off point obtained when psychological wellbeing (i.e., GHQ-12) is mapped onto depression for the police sample in Study Three will be similar to the recommended cut-off point of 10/11 for the Australian population.	Accepted	Obtained cut-off point of 11.5 on GHQ-12 highly similar to recommended population cut off.
Hypothesis 7. The cut-off point obtained when psychological distress (i.e., K10) is mapped onto depression for the police sample in Study Three will be similar to the recommended cut-off point of 30 for the Australian population.	Rejected	Obtained cut-off of 15 on K10 considerably less than recommended population cut-off.

The results obtained through data analyses undertaken in this thesis will be discussed in detail in the next chapter. In particular, the results will be explored in terms of their implications for theory, practice and future research.

CHAPTER 5: DISCUSSION

The main aim of this thesis was to compare the predictive ability of job characteristics (i.e., as measured by the DCS components) and organisational justice in terms of the mental health of sworn police officers. In order to fulfil this aim, the following hypotheses were tested in the cross-sectional and prospective studies:

Hypothesis 1a. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of context-free mental health (i.e., psychological wellbeing) at one point in time.

Hypothesis 1b. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of context-free mental health (i.e., psychological wellbeing, psychological distress and depression) across a period of one year.

Hypothesis 2. The work characteristics of the DCS model (i.e., job demand, job control and social support) will be significant predictors of job-specific mental health (i.e., job satisfaction) at one point in time.

Hypothesis 3a. The work characteristics of the DCS model (i.e., job demand, job control and social support) will demonstrate a non-linear and/or interaction effect with the mental health outcomes (i.e., psychological wellbeing and/or job satisfaction) at one point in time.

Hypothesis 3b. The work characteristics of the DCS model (i.e., job demand, job control and social support) will demonstrate a non-linear and/or interaction effect with the mental health outcomes (i.e., psychological wellbeing and/or psychological distress and/or depression) across a period of one year.

Hypothesis 4a. Organisational justice will contribute unique variance to employee mental health (i.e., psychological wellbeing and/or job satisfaction) over-and-above the variance attributed to the components of the DCS model at one point in time.

Hypothesis 4b. Organisational justice will contribute unique variance to employee mental health (i.e., psychological wellbeing, psychological distress and depression) over-and-above the variance attributed to the components of the DCS model across a period of one year.

Hypothesis 5a. The procedural justice by distributive justice (P x D) interaction effect will be significantly related to mental health (i.e., psychological wellbeing and/or job satisfaction) at one point in time.

Hypothesis 5b. The procedural justice by distributive justice (P x D) interaction effect will be significantly related to mental health (i.e., psychological wellbeing, psychological distress and depression) across a period of one year.

According to the results of the hierarchical multiple regression analyses, Hypothesis 1a was partially supported, whereby job demands and work-based support were significantly related to context-free mental health in the form of psychological wellbeing when measured at the same time. The comparable hypothesis for the prospective study, Hypothesis 1b was also partially supported. In particular, job demands were significantly related to context-free mental health at follow-up in the form of psychological wellbeing and psychological distress, but not depression. Based on these results, the effects of job demands on context-free mental health appear to persist for at least one year.

Hypothesis 2, that the DCS components would be significantly related to job-specific mental health in the form of job satisfaction in the cross-sectional study was not supported. It

was not possible to test whether the effects of the DCS components persisted onto job satisfaction at follow-up due to lack of data.

Hypothesis 3a was partially supported. There was no evidence for curvilinear DCS effects onto psychological wellbeing or job satisfaction, nor were any of the three-way DCS interaction effects significant. However, the two-way interaction, job control by support at work, was significant when regressed onto psychological wellbeing. The analogous hypothesis for the prospective study, Hypothesis 3b was also partially supported. Similar to the first study, there was no evidence of curvilinear (i.e., non-linear) effects in the prospective study. Although there was no evidence of significant two-way interaction effects, the three-way interaction effect between job control, job demand and support at work was significantly related to psychological wellbeing at follow-up. This result supports the notion of a "high strain" job as being noxious for employee health, particularly long term health.

Hypothesis 4a, that organisational justice would be significantly related to mental health over and above the DCS variables was partially supported. Specifically, the results for the hierarchical multiple regression onto job satisfaction demonstrated that three types of organisational justice (i.e., distributive, interpersonal and informational justice) accounted for significant variance over and above that already accounted for by the DCS variables. Organisational justice did not contribute unique variance to psychological wellbeing (i.e., context free mental health) at Time 1. The related hypothesis for the prospective study onto context-free mental health, Hypothesis 4b, was not supported. When considered together these results of the cross sectional and prospective studies may indicate that the capacity for organisational justice to explain variance in mental health outcomes over and above the variance accounted for by the DCS components may be limited to cross-sectional studies.

Further, unique effects of justice over and above the effects of job characteristics may be limited to job-specific mental health outcomes, such as job satisfaction, which may explain the lack of significant effects onto context-free mental health outcomes at both baseline and follow up. It was not possible to investigate the effects of organisational justice onto job satisfaction at follow-up due to lack of data.

Hypothesis 5a, that the organisational justice interaction effect would be significantly related to mental health, was partially supported. The most commonly studied organisational justice interaction effect, the two-way procedural by distributive interaction effect, was significantly related to job satisfaction. The justice interaction effect was not significantly related to psychological wellbeing. Nevertheless, the significant result between organisational justice and job satisfaction provides support for the 'fair process effect', whereby the impact of distributive justice is moderated by procedural justice. The comparable hypothesis for the prospective study was not supported, suggesting that the off-setting effect between procedural justice and distributive justice does not have a persisting effect on employee mental health, at least in terms of context-free mental health.

Overall, the results of the hierarchical multiple regression analyses conducted in the cross-sectional and prospective studies provide strong support for the effects of job demands on mental health. In contrast to the job level resources, job control and social support, job demands were the only DCS component to remain significantly related to mental health at one-year follow-up. Job demands may have remained significant in the prospective study due to being a stressor, rather than a resource. Similar to job control and social support, organisational justice is a resource. Three types of organisational justice exhibited significant main effects (over and above the effect of the DCS components) on mental health in the cross-

sectional study; however, these effects did not remain significant at follow-up and their effect was limited to job-specific mental health. The significant organisational justice interaction effect in the cross-sectional study similarly failed to reach significance when regressed against mental health outcomes in the prospective study. This result provides additional evidence to perhaps suggest that the unique effects of justice are temporally limited (i.e., to less than one year) and further, adds to the possibility that resources (both job and organisational) are not related to mental health outcomes as strongly as demands.

In addition to the primary aim of this thesis, to explore the explanatory power of work characteristics and organisational justice in terms of mental health, this thesis also sought to explore the relationships between the three context-free mental health variables (i.e., psychological wellbeing, psychological distress and depression) in order to determine whether an inference could be drawn about the prevalence of work-related depression in Australia. The following two hypotheses were tested in the third study:

Hypothesis 6. The cut-off point obtained when psychological wellbeing (i.e., GHQ-12) is mapped onto depression for the police sample in Study Three will be similar to the recommended cut-off point of 10/11 for the Australian population.

Hypothesis 7. The cut-off point obtained when psychological distress (i.e., K10) is mapped onto depression for the police sample in Study Three will be similar to the recommended cut-off point of 30 for the Australian population.

According to the results obtained in the third study, Hypothesis 6, that the cut-off point obtained for psychological wellbeing in this thesis would be similar to the recommended cut-off point for the broader population was supported. In contrast, Hypothesis 7, that the cut-off point obtained for psychological distress in this thesis would be similar to the recommended cut-off point for the wider Australian population was not supported. The obtained cut-off points provide information as to how the three context-free mental health variables are related to each other. The similarity between the obtained cut-off point and the recommended cut-off point for psychological wellbeing allows an inference to be made in regards to the possible prevalence of work-related depression in Australia.

The theoretical and practical implications of the results from the three studies that form this thesis will be discussed along with the results in the remainder of the discussion section. Considering the shared aim of the cross-sectional and prospective studies, (i.e., comparing the predictive ability of work characteristics and organisational justice in terms of the mental health), the implications of these two studies will be discussed together. Following this, the results of the third study will be explored and potential inferences will be drawn as to how the findings may relate to the working population of Australia as a whole.

5.1 The Influence of the DCS Variables- Job-Specific vs. Context-Free Mental Health

The results of the regression analyses in study one and two provided strong support for the DCS model. In the cross-sectional study, job demands, job control and work-based social support were significantly related to at least one, if not both, measures of mental health. Two

indicators of mental health were utilised in study one; psychological wellbeing (i.e., a context-free measure and job satisfaction (i.e., a job-specific measure).

When considered together, the job characteristics captured a substantial amount of variance in the psychological wellbeing target variable in the first study. This result suggests that job characteristics make a sizeable contribution to the psychological wellbeing of employees. However, the percentage of variance accounted for in the psychological wellbeing outcome was comparably lower than the variance accounted for, by the job characteristics, in the job satisfaction outcome. According to the regression onto job satisfaction, almost half of the variance (i.e., 47.8%) was accounted for by the three DCS components. This high percentage of explained variance in job satisfaction suggests that of all possible antecedents, job characteristics make a vast contribution to an individual's level of job satisfaction. Considering the results of the separate cross-sectional regression analyses, it appears that job characteristics are significantly associated with employee mental health, particularly job satisfaction. The components of job demands and work-based social support appear to be closely associated with employee mental health due to being related to both context-free and job-specific mental health. Further, job control may play a key role in terms of job satisfaction. It is this significant relationship between job control and job satisfaction that may suggest that work-related characteristics are more strongly related to job-specific measures of mental health (i.e., job satisfaction), as opposed to context-free measures of mental health (i.e., psychological wellbeing). That is, job control was not significantly related to psychological wellbeing, although, it was significantly related to job satisfaction. The additional link between the DCS model and job satisfaction perhaps provides evidence that the components of the DCS model are more closely related to job specific mental health, with this

assertion being supported by the greater amount of explained variance in the satisfaction outcome.

The greater association between job characteristics and job satisfaction, compared to psychological wellbeing, is supported by a recent meta-analysis. In particular, a review of 83 high quality DCS studies revealed that of studies investigating the effects of job characteristics, a greater percentage of studies found support for additive effects of the DC/S model onto job satisfaction than onto psychological wellbeing (Hausser, et al., 2010). In particular, based on previous DCS studies that obtained data during a comparable period to the data in this project, full support was found for additive effects (i.e., main effects of job demands, job control *and* social support) in 28% of studies onto psychological wellbeing compared to 42% of studies onto job satisfaction (Hausser, et al., 2010). The findings of this thesis are therefore in line with this trend (i.e., a higher likelihood of job characteristics being related to job satisfaction than psychological wellbeing). Examination of individual studies that have included both psychological wellbeing and job satisfaction as outcome variables provide further evidence for job characteristics being more strongly related to job satisfaction. A study of employees at a manufacturing company, for example, found that job demands and control were more strongly related to job satisfaction than psychological strain, measured using the same GHQ-12 utilised in this project (Beehr, et al., 2001). Based on their findings, the authors of that particular study deemed psychological wellbeing and job satisfaction as indicators of mental health that are worthy of separate investigation. The inclusion of both psychological wellbeing and job satisfaction as target variables in the cross sectional study in this thesis allowed for an assessment about whether job characteristics are more strongly related to job-specific or context-free indicators of mental health. The results of the first study

indicate that job characteristics are more likely to influence one's satisfaction with the job than one's self-report reported general mental health (i.e., psychological wellbeing). It is not possible to make a similar assessment based on the prospective data in this thesis due to lack of job satisfaction data. Nevertheless, the explanatory power of the DCS components can be evaluated across the spectrum of context-free mental health indicators that were included in the second study.

5.2 The Influence of the DCS Variables on Prospective Context-Free Mental Health

The second study in this thesis consisted of three context-free mental health outcomes, namely psychological wellbeing, psychological distress and depression. According to the results of the regression analyses, job demands demonstrated a significant effect on psychological wellbeing and psychological distress at follow-up. Job demands were not significantly related to depression. However, it appears that the influence of job demands onto context-free mental health one year later is greater than the influence of job level resources on prospective mental health, with job control and social support failing to reach significance when regressed onto any of the three context-free mental health measures in the prospective study. The lack of significant results between job control and social support onto mental health in the prospective study does not necessarily suggest that job control and social support do not influence the mental health of employees. Rather, the results may indicate that the effects of job control and social support may not persist for as long as 12 months. In comparison, the results suggest that the effect of job demands on mental health may persist for a minimum of one year, as evidenced by the significant relationships between demands and psychological wellbeing, and job demands and psychological distress.

Although job demands were the only component of the DCS model to be significantly related to context-free mental health one year later, the results demonstrated that job demands in isolation still accounted for a reasonable amount of variance. After controlling for baseline mental health and the entry of the DCS linear terms into the regression analyses, the percentage of explained variance for psychological wellbeing and psychological distress was 3% and 4.7% respectively. The similarity of these percentages indicates that job demands have approximately the same impact on employees' levels of psychological wellbeing and psychological distress when measured at one year follow-up.

The majority of previous research based on the DC/S model is cross-sectional in nature (see Hausser, et al., 2010; van der Doef & Maes, 1999), rendering it difficult to make comparisons between the results of the prospective study in this thesis and previous longitudinal DCS studies. Further, of the longitudinal studies that have investigated the effects of the DCS model on mental health, few have included more than one measure of context-free mental health in the one study, thereby making it difficult to compare how the job characteristics are related to different indicators.

5.3 Comparing the Influence of the DCS Variables across Time

Psychological wellbeing was included as a context-free measure of mental health in both the cross-sectional and prospective studies. Consequently, it is possible to compare the effects of the DCS components on psychological wellbeing at both baseline and follow-up. A comparison of the cross-sectional and prospective regression results onto psychological wellbeing demonstrates that job demands were significant antecedents in both studies. In combination, these findings indicate that job demands affect an employee's level of

psychological wellbeing at time of enquiry and also one year later. Similar to job demands, work-based social support was also significantly related to psychological wellbeing at baseline. However, the significant effect of work-based social support did not persist when psychological wellbeing was measured at follow-up.

In contrast to job demands, it appears that the influence of work-based social support has a more limited effect on context-free mental health. The drop in explained variance in the psychological wellbeing outcome across time one and time two may be due to the significant effect of work-based social support becoming non-significant. Alternatively, it is possible that the total explained variance in psychological wellbeing in the prospective study may have dropped compared to the cross-sectional study (i.e. 13.2% to 3%) due to controlling for time one mental health. Nevertheless, it appears that job demands have a more enduring affect on mental health than the other components of the DCS model.

5.4 The Effects of Job Demands

Job demands refers to time pressures, monitoring demands or problem solving demands that may negatively impact on employee health (Beehr, et al., 2001; Karasek, 1979). Job demands were significantly related to both the context-free and the job-specific measures of mental health (i.e., psychological wellbeing and job satisfaction) in the cross-sectional study in this thesis. The relationship between job demands and the two indicators of mental health were in the expected direction. That is, high level of demands was negatively related to psychological wellbeing and job satisfaction. Similar results have been found in previous cross-sectional studies. In a recent cross-sectional study of correctional officers (i.e., employees in an occupation similar to policing) job-specific demands and monitoring demands were

significantly related to job satisfaction (Brough & Williams, 2007). Interestingly, level of problem solving demands in that particular study was not significantly related to job satisfaction. A global measure of job demands was utilised in this thesis, therefore no distinctions can be drawn between the nature of job demands that demonstrated significant results in the aforementioned study and the types of demands in this thesis. Nevertheless, it appears that job demands are consistently related to measures of employee health. In addition to demonstrating short term effects on mental health outcomes, it appears that job demands also have the capacity to impact on longer term health. According to the results of the prospective study in this thesis, high levels of job demands were related to both psychological distress and poor psychological wellbeing one year later. Job demands have been related in previous longitudinal DCS research to mental health outcomes including psychological distress and emotional exhaustion (Bourbonnais, et al., 1999).

Emotional exhaustion is a sign of burnout, whereby the individual's energy is exhausted (Maslach & Leiter, 1997). Employees in human services may be at greater risk of emotional exhaustion than those employed in other occupations. However, compared to other human services occupations, the level of emotional exhaustion amongst policing employees has been claimed to be significantly lower (Gaines & Jermier, 1983). Nevertheless, within policing organisations, members of the patrol force experience significantly greater emotional exhaustion than other police employees (Gaines & Jermier, 1983).

In addition to previous studies where job demands have been linked to emotional exhaustion, it has been suggested that an employee is more likely to perceive their job as demanding and/or stressful if they are experiencing symptoms of burnout or exhaustion (Bakker et al.,

2008). It is therefore possible that the relationship between job demands and emotional exhaustion is bi-directional. Although emotional exhaustion was not included as an outcome measure in this thesis, the adverse influence of job demands on mental health demonstrated in this thesis suggests high job demands would most likely be related to emotional exhaustion in police officers.

When considered together, the results of the cross-sectional and prospective studies in this thesis indicate that the impact of high job demands on mental health may be both immediate as well as enduring for individuals whose jobs are characterised by increased qualitative and/or quantitative pressures.

5.5 Short Term Amelioration of Resources

The significant effects of job control and work-based social support in the cross-sectional study suggests that the mental health of employees is likely to be enhanced if they are provided with decision authority (i.e., ability to alter ones working procedures or schedules), skill discretion (i.e., the extent that a variety of skills can be employed while undertaking work tasks) and/or support from supervisors and colleagues (Jones & Fletcher, 2003; Karasek & Theorell, 1990). Work-based social support predicted both psychological wellbeing and job satisfaction, suggesting that support provided by supervisors and colleagues may be particularly valuable for protecting and enhancing employee wellbeing. The effects of job control and social support did not persist however when mental health was measured at follow-up. The lack of significant results for job control and social support in the prospective study in this thesis may indicate that job level resources are limited temporally and that their effects on mental health tend to last for less than one year. In particular, job control and social

support may be more temporally limited relative to job demands. A very large study of civil servants, for instance, found that job demands, job control and social support were all significantly related to psychological wellbeing at time one, but the effect of job control failed to persist at follow-up (Rydstedt, Ferrie, & Head, 2006). The effect of work based social support in that study persisted along with job demands. Similar results have been found in previous longitudinal DCS studies onto psychological wellbeing, with findings indicating that job level resources may be limited to short term amelioration. Although the time lag in this thesis and the aforementioned study was one year (Rydstedt, et al., 2006), it appears that supportive results may be found in studies where the time lag is as short as one month. After a one month lapse, the effect of job control (i.e., a type of job resource) no longer demonstrated a significant relationship with wellbeing (Daniels & Guppy, 1994). The effect of social support, another type of job resource, did remain significantly related to psychological wellbeing in that particular study. Although the time lag in this thesis was considerably greater (i.e., one year compared to one month), it is possible that the relationship between social support and mental health may be explained in terms of how it is conceptualised.

Social support was measured in this thesis using a disaggregate measure, consisting of work-based and non-work based social support (rather than a global measure of social support). The use of a disaggregate measure of social support in this thesis is supported by previous research. In particular, whether social support is effective or not depends on whether the support is appropriately matched to the demand the individual is facing (Cutrona, 1990; Sarason, et al., 1990). Work-based social support, for example, is more likely to promote employee health than support provided from outside the workplace (House & Kahn, 1985). The results of the cross sectional study in this thesis support this assertion, because both the

psychological wellbeing and job satisfaction of employees was significantly related to support from within the workplace. In comparison, support provided from non-work sources did not demonstrate a significant effect. The level of social support provided by organisational members to employees may be a key determinant for the promotion of employee mental health, particularly in the short term.

5.6 Linearity of the DCS Model

The hierarchical regression analyses in this thesis, in study one and two, included both linear and curvilinear terms for each of the DCS components based on previous research that has found the DCS components may exhibit curvilinear effects on health outcomes. Considering that the linear DCS terms were significantly related to mental health in this thesis, while the curvilinear terms failed to reach significance, it appears that job characteristics have a direct effect on mental health. That is, increases or decreases in the job characteristics were associated with proportional increases or decreases in the outcome measures. *Increases* in job demands, for example, were related to comparative *decreases* in psychological wellbeing and job satisfaction. *Increases* in social support at work were associated with relative *increases* in psychological wellbeing and job satisfaction. The existence of linear relationships in this thesis are in line with the majority of previous DCS research studies (van der Doef & Maes, 1999). In addition to cross-sectional research, there is little support for the existence of curvilinear relationships between components of the DCS model and mental health in longitudinal research (Rydstedt, et al., 2006). The absence of significant curvilinear terms does not suggest that they are not worthy of investigation in future research. On the contrary, it is perhaps vital that non-linear terms are included in DCS studies in order to ascertain

whether significant interaction effects, which form the crux of the DCS model (Karasek, 1979; Karasek & Theorell, 1990), are genuine offsetting relationships (Fletcher & Jones, 1993; Ganzach, 1997).

5.7 Two-Way Interaction Effects of the DCS Model

According to the DCS model, the mental health of employees is likely to be adversely affected if their job is characterised by high work-related demands, few opportunities for control or autonomy, and/or insufficient social support (Karasek, 1979; Karasek & Theorell, 1990). The results of both the cross-sectional and prospective studies in this thesis failed to find support for the two-way job demand by job control interaction effect. Considering that significant D x C interactions usually indicate that the negative effects of job demands are buffered by high levels of job control (van der Doef & Maes, 1999), the lack of significant D x C interaction effects in this thesis indicates that high levels of job control do not protect against the effects of high job demands on the mental health of police officers. Further, the D x C interactions were not significantly related to context-free or job-specific mental health in either the cross sectional study or at one year follow-up.

Although the two-way D x C interaction effect is proposed to exist according to the original DC model particularly (Karasek, 1979), the lack of support in this thesis for the D x C interaction effect is not entirely surprising based on previous empirical studies. Non-significant D x C results have been found in previous studies that have used mental health measures comparable to the measures used in this thesis (Johnson, et al., 1995) and evidence for interaction effects between components of the DC/S model generally is inconsistent (de Lange, et al., 2003; van der Doef & Maes, 1999). It has been claimed that the likelihood of a D x C interaction effect being significantly related to organisational or employee health

outcomes is between 39 and 48% (Hausser, et al., 2010; van der Doef & Maes, 1999). The likelihood of the D x C interaction effect being significant is therefore less probable than chance. In addition, the reported percentage rate of significant D x C interaction effects may be inaccurately high. Previous research has found that apparently significant D x C interaction effects may become non-significant once curvilinearity is accounted for (Fletcher & Jones, 1993). It is consequently possible that at least some of the significant D x C interaction effects that led to the creation of the reported percentages may not be genuine results. That is, if non-linear DCS relationships were not explored in those studies, the seemingly significant D x C interaction effects may not have been true effects.

The addition of social support to the original DC model has rendered it possible to study additional interaction effects. In this thesis, the components of the DCS model were used to create five two-way interaction effects. In the cross-sectional study, the two-way interaction effect between job control and support at work (C x S) was significantly related to context-free mental health in the form of psychological wellbeing. This result suggests that the impact of job control on psychological wellbeing may be buffered by work-based social support. Alternatively, it could suggest that the impact of work-based social support on psychological wellbeing may be ameliorated by the presence of job control. Regardless of how the relationship is conceptualised, the significant result indicates that the level of control and the level of social support an employee is afforded, work in combination together and jointly impact mental health. The implication of this significant finding is that employees who have low levels of job control (perhaps due to having low status in their organisation), may not necessarily experience poor mental health as would usually be predicted, because the usual negative effects of low autonomy may be buffered by high levels of social support

within the workplace. Conceptualising this relationship in the reverse form, the significant C x S finding indicates that employees who have low levels of work-based social support may not experience poor mental health if they have a high degree of autonomy. Considering that the direct effect of work-based social support was also significant in the cross-sectional analysis onto psychological wellbeing, organisations would perhaps benefit from first providing employees with a more supportive working environment. The lack of a significant main effect of job control onto wellbeing indicates that focusing purely on increasing the number of opportunities for employees to choose their own work tasks may not necessarily lead to improved mental health. Therefore, if organisations have to make a choice between allowing employees greater control over their work or alternatively, providing them with greater social support the results suggest they should focus first on the provision of support, particularly as it may buffer low levels of job control, as evidenced by the significant two way C x S interaction effect.

In summary, the two-way interaction effect between job control and social support was significantly related to psychological wellbeing in the cross-sectional study. In terms of health promotion strategies, organisations may benefit from increasing social support within the workplace as their priority considering that work-based social support also has a direct effect. According to the results of the prospective study, the off-setting effect between job control and support did not persist when psychological wellbeing data was collected at one-year follow-up. The joint effect of these two resources on mental health may appear to be relatively limited in time based on the lack of a significant C x S interaction effect in the prospective study. However, the results of the prospective study indicate that the effects of job control and

social support do buffer against poor mental health, as long as job demands are also considered as part of the equation.

5.8 Three-Way Interaction Effect of the DCS Model

Two three-way interaction terms were included in both the cross-sectional and prospective studies in this thesis (i.e., job control x job demand x work-based social support; job control x job demand x non work-based social support). In the cross-sectional study, neither of the three-way DCS interaction terms was significantly related to mental health. A context-free and a job-specific measure of mental health were included in the cross sectional study. Based on the lack of significant results for both outcomes in the first study, it does not appear that the three-way DCS interaction terms are more likely to be related to context-free or job-specific mental health outcomes. In the prospective study, three context-free measures of mental health were included as target variables. The three-way DCS interaction term (i.e., the term including work based support) was significantly related to psychological wellbeing at follow-up. This significant result indicates that high levels of job control and social support from within the police officer's workplace have the ability to counter-act the negative effects of high job demands on mental health.

Although the C x D x S interaction was significantly related to psychological wellbeing, it was not significantly related to psychological distress or depression at follow-up. Partial support for the three-way DCS interaction effect was expected however, based on inconsistent support within the literature for interactions generally and the low probability of a three-way DCS interaction effect being significant (Hausser, et al., 2010). It appears that the probability of the DCS interaction being significant is greater for studies that are cross-

sectional in nature, however, the probabilities remain low regardless of the nature of the study (Hausser, et al., 2010; van der Doef & Maes, 1999). Further, it appears that whether the DCS components exert a joint effect may depend on how mental health is conceptualised.

In this thesis, the three-way DCS interaction effect was not significantly related to psychological wellbeing at baseline. Social support and job control have been found previously however to off-set the influence of job demands on the psychological distress of employees (Akerboom & Maes, 2006). "Psychological distress" in Akerboom and colleagues' study consisted of anxiety and depression items and there were twice as many items compared to the measure of psychological wellbeing used in this thesis. Similarly, the three-way DCS interaction term has been found in one cross-sectional study to significantly predict context-free mental health but not job-specific mental health (Macklin, Smith, & Dollard, 2006). In contrast, the three way DCS interaction term significantly predicted job-related satisfaction in another cross sectional study but did not predict context free emotional exhaustion (Pascual, et al., 2003). Therefore, based on a comparison of findings in this thesis and previous empirical research, it is possible that whether or not the three way interaction term is significantly related to mental health may depend on how mental health is conceptualised or measured.

5.9 The Influence of Organisational Justice on Mental Health

In this thesis, the DCS model was expanded to include organisational justice in order to compare the predictive utility of job characteristics and organisational justice. Although a limited number of studies have investigated the unique effects of organisational justice onto employee mental health, results have tended to find that organisational justice contributes unique variance to mental health, particularly psychological wellbeing. The lack of significant

relationships between types of organisational justice and psychological wellbeing in this thesis was therefore unexpected. According to the results from one of the first justice-health cross-sectional studies to be published, for example, there was a significant relationship between low levels of procedural justice and context-free mental health (measured with the same GHQ-12 scale utilised in this thesis) after adjusting for job demands, job control, social support and behaviour risks (Elovainio, et al., 2002). Although the regression onto psychological wellbeing was not significant in this thesis in comparison to the significant result in early justice-health research, it is possible that the lack of a significant result in this thesis may be explained by differences between the studies.

The sample in the early justice-health study was split by gender and organisational justice only demonstrated significant unique effects over and above the DCS components for the females in the study, with the effect failing to reach significance for the male sample (Elovainio, et al., 2002). The sample in this thesis was not split by gender; therefore, it is possible that organisational justice did not contribute unique variance to psychological wellbeing due to the sample consisting of both males and females. Further, the majority of the sample in this thesis was male (i.e., 78%) which decreases the likelihood of organisational justice demonstrating unique effects if they are indeed dependent on gender as suggested by previous research. Although it may have been possible to split the sample in this thesis by gender, the sample of females would have been substantially smaller than the sample of males and due to the comparatively small number of females, the sample may not have been large enough to withstand the assumptions of regression analysis.

In addition to psychological wellbeing, job satisfaction was included in the cross-sectional study in this thesis as a measure of mental health. The inclusion of psychological

wellbeing and job satisfaction as target variables in the cross-sectional study is in line with a vast body of previous research within organisational psychology (Schmitt & Dorfel, 1999). In contrast to the non-significant results between justice and psychological wellbeing, organisational justice contributed unique variance to the job satisfaction outcome. Specifically, distributive justice, interpersonal justice and informational justice were all significantly related to job satisfaction after controlling for the effects of the DCS model. Considering that the organisational justice dimensions were added into the regression analyses after addition of the DCS terms, the significant relationships between these three types of organisational justice and job satisfaction indicates that organisational justice contributes unique variance to the job satisfaction outcome over and above the variance already captured by the DCS components.

The impact of organisational justice on employee health outcomes is relatively new and studies are limited in number (Fujishiro & Heaney, 2007) and it appears that even fewer studies, if any, have sought to determine the impact of organisational justice onto job satisfaction after controlling for job characteristics. It is therefore difficult to compare the results of this thesis to previous justice-job satisfaction studies, due to the lack of results within the literature regarding the ability of organisational justice to contribute unique variance to job satisfaction. Nevertheless, it is possible to make comparisons between the results of this thesis and previous justice-job satisfaction research, albeit studies where job characteristics were not controlled for.

Types of organisational justice have been found in previous studies to demonstrate a significant relationship with job satisfaction (Colquitt, et al., 2001). A significant relationship has been found between procedural justice and job satisfaction in a sample of factory

employees for example (Schmitt & Dorfel, 1999). Similarly, interpersonal justice and informational justice have been found to significantly predict level of job satisfaction for full time employees (Loi, et al., 2009). Although previous research has found support for significant relationships between dimensions of justice and job satisfaction, the results of this thesis indicate that distributive, interpersonal and informational justice are more strongly related to job satisfaction than procedural justice, which did not demonstrate a significant main effect in this thesis. The results of this thesis consequently support the claim that distributive justice is more highly associated with job specific attitudes such as job satisfaction, than procedural justice, with procedural justice tending to be more highly related to global measures (Greenberg & Colquitt, 2005). It is interesting to note that a recent meta-analysis of organisational justice reported that procedural justice was most strongly related to job satisfaction, followed by distributive justice, then informational justice and finally, interpersonal justice (Colquitt, et al., 2001). The findings of this thesis are in stark contrast to the results of the meta-analysis in terms of procedural justice, because the relationship between procedural justice and job satisfaction in this thesis was not significant. Based on a comparison of the sample in that particular meta-analysis and the sample in this thesis, it is possible that the effects of organisational justice differed due to sample size and nature of the samples. In comparison to the meta-analysis, which consisted of 183 studies and employees from a range of occupations, the sample in this thesis was comparatively smaller as well as homogenous, consisting of employees from the police force and no other occupations.

In addition to sample size and occupation, perceptions of justice can reportedly be influenced by other factors related to the participants. Results from a large study of employees from public and private industry indicated that education level may influence justice

perceptions, with primary level educated employees more likely to perceive their organisation as being procedurally just compared to employees with secondary or certificate level education (Nurse & Devonish, 2007). In this thesis, the vast majority of participants had completed secondary school or higher education. Therefore, it is possible that procedural justice was not significantly related to job satisfaction in this thesis due to the large percentage of participants who were secondary or further educated and were therefore less likely to endorse the procedural justice items on the survey. Although education level may account for why procedural justice did not demonstrate a significant relationship with job satisfaction in this thesis, other possible explanations exist. There is evidence to suggest, for example, that an employee's salary, level of negative affectivity and self-esteem are significantly related to perceptions of organisational justice, particularly perceptions of procedural and interactional justice (Cohen-Charash & Spector, 2001). Therefore, based on the findings of previous organisational justice research, the influence of organisational justice on employee mental health may be at least partially explained by study design and demographic characteristics of the sample.

Although only three of the four types of organisational justice demonstrated effects over and above the job characteristics, the results of the analysis onto job satisfaction build on the recent body of research into the effects of justice on employee mental health and partially supports the view that justice may be "the new psychosocial predictor of health" (Elovainio, et al., 2002).

5.10 Fair Process Effect of Organisational Justice

In addition to examining whether organisational justice demonstrated significant main effects onto mental health, an interaction term between distributive justice and procedural justice (P x D) was included in order to determine whether the effects of distributive justice on mental health are moderated by procedural justice.

The P x D interaction term was significantly related to job-specific mental health in the form of job satisfaction in the cross-sectional study. This result supports the "fair process effect" (Van den Bos, 2005) and indicates that employees who consider the outcomes allocated to them, or not allocated to them, as unfair will be less dissatisfied if they perceive that the decision-making procedures used to decide the allocation of outcomes was carried out in a fair manner (Greenberg & Folger, 1983; Shapiro & Brett, 1993). This result is particularly relevant to contemporary organisations, as it is difficult to satisfy candidates who have all applied for the same job promotion, for example, as only one person can be allocated the job. By ensuring that decision-making procedures are fair however, individuals finding themselves in such a circumstance may be more forgiving of the unfavourable decision. Further, considering that a survey of police officers found that 'not being chosen for a promotion' was equally as stressful as 'pursuing an armed suspect' (Sewell, 1983), the implementation of fair procedures may be particularly important when organisational members make such promotion decisions in order to prevent the deterioration of mental health for those employees who are not allocated the reward.

5.11 Adaptation Effect of Demands on Mental Health

The enduring effects of job demands on the mental health of employees in this thesis indicates that demands have adaptation effects that are detrimental to employee mental health, particularly their levels of psychological wellbeing and psychological distress. In line with the GAS model, it appears that employees are likely to experience a stress-related response (i.e., poor mental health) if the demands they are exposed to are present for a prolonged period, with this "irritation" leading to the exhaustion of an individual's adaptation energy and subsequently, an associated decline in health (Selye, 1976).

It has been claimed that any demand that taxes the adaptive ability of individuals can be regarded as being stressful (Selye, 1956). The demands faced by businessmen, air traffic employees and carers of terminally ill persons, for example, may be different in nature, but they are similar in the sense that they all have the potential to lead to stress related responses (Selye, 1974). It is therefore possible that even though the demands encountered by the sample of police officers in this thesis may be different demands than those encountered by individuals employed in other organisations, the results may be relevant at a broad level to individuals from other occupations in terms of how demands can impact on health.

Based on the three stages of the GAS model, the initial exposure to job demands activates the defensive mechanisms of the body and this occurs during the "alarm" stage (Selye, 1976). Considering that the body cannot remain in a state of alarm, the individual enters a stage of adaptation or resistance, however, the body's ability to adapt to high job demands or "adaptation energy" is eventually exhausted due to continued exposure to the demand, leading to the development of stress-related health problems (Selye, 1976). In terms of this thesis, it was demonstrated that there is an association between the presence of high job

demands at baseline and stress-related health problems in the form of poor mental health at one year follow up. It appears that during the stage of resistance, the effects of high job demands are adapted to for a certain amount of time. Eventually through the continued exposure to high demands the body succumbs to exhaustion however due to stores of adaptation energy being finite (Selye, 1974).

Similar results, linking demands at work with consequent employee health, have been found in previous research based on the GAS model. Employees working with an insurance company were requested to work additional hours (approximately 73 hours per employee) per week over a two month period, with adrenaline levels used to indicate the effect of increased job demands on employee health (Rissler & Elgerot, 1978). The results demonstrated that the effect of increased job demands accumulates over time, with the full adverse impact on the health of the employees being experienced at the conclusion of the overtime period, one month after the peak in overtime hours. Considering that the time period in this thesis between the collection of job demand and mental health data was one year, the results suggest that the effects of job demands have the potential to adversely impact on health for at least 12 months. Further, based on previous research, it appears that the adverse effects on health from exposure to high job demands at baseline will persist even if job demands are negligible when mental health is measured (Rissler & Elgerot, 1978). A preventative approach to employee health therefore appears to be most appropriate, whereby organisations aim to minimise the level of stressors employees are exposed to in order to optimise their longer term health. Based on the results obtained in this thesis and results from previous studies, if organisations take a reactive approach to employee health (i.e., waiting until an employee shows signs of stress-related health), perhaps it will not be possible to reverse the adverse effects of increased

job demands, particularly if the demands were experienced at a prior time. However, considering that job demands may also have an immediate influence on employee health (based on the significant results between demands and two indicators of mental health in the cross sectional study), minimising stressors as soon as they are deemed to be excessive may still have a beneficial impact on health.

Although stressors encountered in the workplace are generally accepted as being associated with poor mental health outcomes, their presence may not always lead to poor health. Environmental demands are appraised by individuals in regards to whether or not they are a threat to wellbeing, particularly in light of whether the resources that are available to them are sufficient to cope with the demand (Lazarus, Cohen, Folkman, Kanner, & Schaefer, 1980). Job control, for example, has the potential to buffer against the effects of job demands (Karasek, 1979). Individuals who have a level of control over the situation they are encountering may have the ability to regulate the level of demand they are facing and consequently, they can perhaps reduce the stressfulness of the situation (Frankenhauser, 1980). In regards to job control within the occupation of policing, police officers have little control over the type or number of demands brought about by the activities of the general public (Ainsworth, 2002). This lack of control within policing may seem to suggest that the demands faced by police officers are therefore more likely to lead to poor health outcomes than employees in other occupations with greater levels of control. Individuals differ in how they respond to demands however, which suggests that high demands may be seen as challenging rather than stressful for particular employees (Lazarus, et al., 1980). The health of employees who perceive demands are challenging may therefore be less likely to be negatively impacted, even if they lack job control. It has been suggested that employees are

more likely to perceive their work as being challenging, rather than as a source of distress, if they are highly engaged with their work (Bakker et al., 2008). Considering that work engagement is characterised by a strong identification with one's work (Bakker et al., 2008), perhaps the mental health of police officers whose identify is tied closely to their job are less likely to be negatively influenced by job demands. In a similar vein, individuals who select an occupation that matches their personal preferences are less likely to experience distress or associated health problems (Selye, 1974). Therefore, if the occupation of policing is suited to the individual in terms of being a good fit, perhaps the alleged lack of control within policing is not necessarily detrimental to health. In addition, if police officers have had experience with similar demands or situations in the past, then the likelihood of a stress-related response is diminished (Ainsworth, 2002). Whether or not the demands encountered by an employee overwhelm their adaptive capacity and consequently have a negative impact on health, may therefore depend on factors such as perception of the stressor as a threat or challenge, whether the occupation is a good fit for the individual and whether the employee has previously experienced similarly intense demands.

5.12 Estimated Prevalence of Work-Related Depression

In relation to the auxiliary aim of this thesis, to investigate the relationships between the three context-free measures of mental health were also investigated in order to explore the possible prevalence of work-related depression in Australia based on the results obtained with the sample of police officers, the results indicated that between one-third (37.2%) and two-thirds (65.5%) of the police officers surveyed in this thesis were classified as depressed based on their score exceeding the recommended cut-off point (of four, or an extreme boundary cut-off

of nine) on the CES-D Iowa instrument (Santor & Coyne, 1997). The reported depression prevalence for the Australian population is 20% (Beyond Blue: The National Depression Initiative, 2008). It is possible that the difference between the reported depression prevalence for the Australian population and the obtained depression prevalence in the current study is due, at least in part, to temporal emphases. In comparison to previous Australian-based research, where the focus was on depression across the lifespan, the CES-D instrument asks respondents to rate how they "have been feeling over the past week" and, therefore, refers to a recent, relatively short, time period (Santor & Coyne, 1997). The higher depression prevalence in this study may be due to the salience of negative events in the preceding week, which research suggests are more cognitively accessible to individuals than positive occurrences due to a "negative memory bias" (Pyszczynski, Hamilton, & Herring, 1989). Further, the number of negative life events experienced by individuals has been shown to be associated with diagnosis of depression (Radloff, 1977). Therefore, the tendency for individuals to recall negative events rather than positive events, and the use of a short reference period in the CES-D (Iowa) scale, may have inflated the number of individuals in the current study being classified as depressed.

The depression prevalence rate obtained in this study should not be discounted, however, and may genuinely reflect the number of depressed individuals in the sample, particularly due to the nature of policing. For example, a study of trained police officers found that they were at an increased risk of psychiatric morbidity compared to the general population (Hodgins, Creamer, & Bell, 2001). Considering that the only occupation investigated in this thesis was policing, the obtained prevalence rate may not apply to the majority of Australian employees, but it does make the case that the number of depressed

individuals in the workforce may be considerable. Further, although the obtained depression prevalence rate is higher than the reported population prevalence rate, it is worth noting that a depression prevalence rate very similar to the statistic obtained in the current study has been found in another study (63.6%, using the full 20-item CES-D) of primary care patients from community clinics (Santor & Coyne, 1997). The similarity of the depression prevalence rates in this sample of police officers and the sample of primary care patients may indicate that individuals employed in occupations that are perhaps more stressful than average share relatively high rates of depression.

In addition to investigating the prevalence of depression within the police sample, the relationships between the three context-free measures of health were explored. Psychological wellbeing and psychological distress were separately mapped onto the depression measure. According to the psychological wellbeing analysis, the obtained cut-off point for the GHQ-12 was 11.5, which is highly similar to the Australian population cut-off point of 10/11 (Donath, 2001). The similarity between these two cut-off points suggests that the point at which Australians tend to experience poor psychological wellbeing may also be the point at which depression becomes likely. The cut-off point obtained for the police officers for the psychological distress analysis for the K10 was 15.5. The cut-off point obtained is substantially different to the recommended cut-off point for the Australian population in terms of psychological distress. In particular, a cut-off point of 30 is generally accepted as indicating that individuals are suffering from 'high' or 'very high' psychological distress (Australian Bureau of Statistics, 2003). Based on the Australian cut-off point, 4% of the population are suffering from concerning levels of psychological distress (Australian Bureau of Statistics,

2006). In contrast, the cut-off point obtained in this thesis indicates that 37% of the Australian population, rather than 4%, are suffering from concerning levels of psychological distress.

In terms of psychological wellbeing, the cut-off point obtained in this thesis and the recommended cut-off point were highly similar. This indicates that the mental health of police officers is perhaps comparable to the mental health of the broader Australian population. In the absence of a direct measure of depression among employed persons in Australia, utilising the psychological wellbeing measure may be a proxy for estimating prevalence of depression.

5.13 Limitations

5.13.1 Study Design

Data for this thesis was obtained from a homogenous sample, comprised of employees within a state-based police force. Reliance on individuals who share traits, such as occupation, may limit the applicability of results to other individuals, such as those who work within other organisations. It has been suggested however that in regards to the DCS model, that homogenous samples provide adequate variation in regards to job characteristics and are as valuable as heterogeneous samples (de Lange, et al., 2003). Further, the likelihood of confirming a DCS buffering effect (either two-way or three-way) is approximately as likely regardless of whether the sample is homogenous (i.e., the same age, occupation etc.) or not (Hausser, et al., 2010). Therefore, the results in this thesis, in terms of the DCS components at least, are purported to be as informative as results that had been obtained from employees with diverse occupations.

The hypotheses proposed in this thesis imply causal links. In regards to the cross-sectional nature of the first study however, causality between the predictor variables and the

target variables cannot be confidently inferred due to the predictor and outcome data being obtained at the same time. It is possible that the significant relationship between level of job demand and job satisfaction, for example, may be reversed or bi-directional, whereby level of job satisfaction impacts on job demands. Research where the predictor data is obtained at an earlier time to the outcome data would overcome this limitation and clarify the causality of relationships. The investigation of similar hypotheses in the prospective study in this thesis therefore provides clarification regarding the direction of relationships.

5.13.2 Common Method Variance

Data was obtained through the use of surveys and depended on the process of self-reporting. The use of self-reported data, particularly for both predictor and target variables, raises the possibility of Common Method Variance (CMV), whereby the measures may overlap due to the data being obtained from the one source, rather than the measures sharing a genuine relationship (Podsakoff & Organ, 1986). Obtaining data from additional sources (i.e., interviews, observations and/or records) rather than relying on the one source, would have been desirable in order to more confidently infer the presence of genuine relationships. However, due to the constraints of the host organisation, it was not possible to collect information from different sources for this project. In future studies, it would be beneficial to obtain further criterion variables from different sources (Podsakoff et al., 2003).

5.13.3 Individual Differences

The transactional approach to stress was the foundation of this thesis, specifically, through the use of the DCS model. Although the transactional approach to stress considers the influences

of individual differences, such as cognitive appraisal of the environment and available coping resources (Lazarus, 1990), the influence of individual characteristics were not investigated. Individual differences were not accounted for because the aim of this thesis was to examine the importance of job characteristics and organisational justice on the mental health of employees in a general sense, regardless of personal characteristics. Further, accounting for individual characteristics would have required the inclusion of additional predictor terms. If additional predictors had been incorporated into the regression models in this thesis, it would have possibly created difficulty comparing the results of this research to the limited body of DCS/justice research. In particular, the inclusion of extra predictor terms would likely have clouded interpretation regarding the unique predictive ability of organisational justice above the effects of job characteristics. Further, a larger sample size may have been required in order to accommodate additional predictor variable and to retain the integrity of the analyses.

5.14 Implications

5.14.1 Implications for Theory and Research

The findings of this thesis demonstrated strong support for the job characteristics of the DCS model as being key determinants of employee mental health. In line with previous research that has found the DCS model to be relevant to various occupations (de Lange, et al., 2003), the components of the DCS model tended to demonstrate significant relationships with the mental health outcomes of police officers. The significant DCS associations in this thesis, coupled with the proportionately large contributions made by the job characteristics to the mental health indicators, lends further support to the use of the DCS model as a foundation for studying both immediate and longer term psychological stress reactions.

In contrast to the components of the DCS model, the findings of this thesis did not demonstrate robust support for organisational justice as a unique predictor of employee mental health. Nevertheless, it appears that there is potential for organisational justice to enhance employee health in particular situations. It is possible that the large amount of variance captured by the job characteristics may explain the limited amount of unique variance captured by organisational justice. In terms of future research in the employee stress domain, an implication of this finding may be that researchers may benefit from investigating both the effects of organisational justice before and after controlling for job characteristics. Based on preliminary organisational justice/health research it was proposed in this thesis that organisational justice would contribute unique variance to mental health outcomes, over and above the influence of job characteristics. Clarity regarding the effects of organisational justice may be gained in future studies first from determining the effects of justice without controlling for job characteristics, hence breaking away from the current trend within justice-health research. Identifying patterns in regards to the types of employee health outcomes that are most affected by organisational justice without controlling for job characteristics may then highlight the outcomes most likely to be related to unique effects of organisational justice. Further, the inclusion of both context-specific and context-free outcomes in future studies may be of value, particularly considering the findings of this thesis with justice demonstrating unique effects onto the context-specific outcome but not the context-free outcomes. Finally, exploring the relationships between different numbers of organisational justice dimensions (i.e., global, two, three or four dimensions) and health outcomes may also assist to more fully understand how different types of organisational justice impacts on health. However, findings from research projects that utilise the four separate dimensions, as per this thesis, may provide

the most clarification. Organisational justice studies that omit justice dimensions may exhibit misleading results, with the included dimensions picking up variance of excluded dimensions (Greenberg & Colquitt, 2005). In general, the value of expanding the DCS model to include organisational justice has the potential to provide an insight into how the broader working environment impacts on health in addition to more specific job stressors.

5.14.2 Implications for Police Officer Health

The investigation of the effects of job characteristics in this thesis onto a spectrum of mental health indicators has provided an insight into how the health of police officers may be affected by their work environment. According to the results of this thesis, the mental health of police officers in both the short term and the longer term is most likely to be affected by the level of demands officers are exposed to in the course of their work.

The nature of the relationship between job demands and mental health outcomes was linear, indicating that increases in job demands were associated with proportional decreases in psychological wellbeing and proportional increases in psychological distress. The main implication of this result is that the level of demands police officers face need to be minimised in order to protect their mental health. However, simply reducing the number of demands officers face may not be a practical solution. The number of demands police officers face are dependent to a large extent on the activities of the general public (Ainsworth, 2002) and "little can be done to buffer members of police departments from their ambivalent, demanding publics" (Gaines et al., 1983, p.583). Although controlling the number of demands made of police officers in general may not be possible, those managing front line police officers may be able to monitor job demands at the more local level. Superiors at individual stations, for

example, may seek to ensure that job demands are spread amongst officers. The delegation of duties across the members of a station would perhaps prevent situations where individual officers are overloaded with so many demands that their mental health is affected.

The importance of monitoring employees' job demands should not be underestimated, particularly in public sector organisations (Adcroft & Willis, 2005; Ackroyd, Kirkpatrick, & Walker, 2007). Due to the adoption of New Public Management (NPM) strategies within public sector organisations, increased pressure is being placed on public sector employees to work effectively and efficiently, yet this results-oriented focus tends to have negative effects in terms of employee health (Noblet, Rodwell & McWilliams, 2006). The findings of this thesis that increased job demands negatively affect employee mental health, suggests that monitoring the pressures placed on employees in public sector organisations, such as the police force, is particularly important in light of the results-oriented reforms being adopted. Further, the impact of job pressures on employees does not remain at the individual level. Through adversely influencing employee health, NPM strategies may indirectly lead to organizational costs and decreased productivity (McHugh & Brennan, 1994). In public services organisations such as the police force, possible flow-on effects may include member shortages at police stations and increased response times due to employee stress and sickness absences. Although it may be difficult to lessen job demands in a results-oriented environment, doing so may have beneficial results for public sector employees as well as the organisation and wider community.

The significant linear relationships found in this thesis between work-based social support and mental health indicators suggests that the establishment of support systems within the workplace may lessen the impact of job demands on the mental health of police officers.

The provision of social support from other individuals within the police force, whether they are colleagues or superiors, may play an integral role in assisting employees to cope with high demands during busy periods or when employees encounter demands or situations they have not previously had experience with. The implementation of buddy systems, for example, may be beneficial, whereby a police officer is paired with another officer. Pairing two police officers who face similar job demands may not only increase the level of social support that is readily available to each of them, it may also increase team spirit or camaraderie. Similarly, establishing a mentoring or coaching relationship by pairing a front line police officer with a person of a more superior rank may also be a valuable approach to negating police officer stress. The value of work-based social support was evident particularly in terms of more immediate police officer mental health.

In contrast to work-based social support, the support provided to police officers from individuals outside of the police force may not be as useful due to a lack of experience or understanding about the day to day occurrences of police work. Therefore, the offer of regular opportunities to debrief with other employees within the police organisation may have a positive effect on police officers' mental health through encouraging a mutually supportive atmosphere and allowing for a discussion about how particular job demands may best be approached in the future. Rather than utilising Employee Assistance Programmes (EAP) strictly for debriefing with an external counsellor (who may or may not fully understand the day to day occurrences of police work), perhaps a counsellors' role could be to assist with setting up peer-based support within the organisation. An externally organised opportunity to debrief on a regular basis with like-minded employees may allow police officers a sense of control over their job and may protect against the adverse effects of job demands.

In addition to work-based social support having a direct impact on the mental health of police officers, work-based social support may also work in combination with job control to enhance the mental health of employees. This suggestion is based on the significant two-way interaction effect between job control and social support at work in the cross-sectional study. For police officers who have a high level of work-based social support, having a high level of autonomy over their work tasks as well may provide an extra 'bonus'-like benefit in terms of psychological wellbeing. Police organisations should focus primarily on increasing social support within the workplace however, rather than providing police officers with additional job control, due to work-based social support also exhibiting a direct effect on mental health. Focusing purely on increasing the number of opportunities for employees to choose their own work tasks (i.e., increasing job control) may not necessarily lead to improved mental health as indicated by the lack of a direct effect of job control onto mental health.

High levels of social support within the police organisation coupled with opportunities for job control may not only enhance mental health of police officers. The findings from this thesis suggest that social support from within the police organisation and a high degree of decision-making freedom also have the ability, in combination, to counter-act or offset high job demands (as evidenced by the significant three-way DCS interaction). For occupations such as policing, where it may not be possible to easily reduce job demands, this result is encouraging because it suggests that even if police officers continue to experience a demanding workload their mental health need not be compromised, as long as sufficient resources are available to them.

Finally, police organisations may be able to optimise the mental health of police officers through an awareness of organisational justice and endeavouring to make

organisational practices as fair as possible. In particular, the off-setting relationship between distributive justice and procedural justice indicates that if superiors within the organisation need to make an allocation decision (i.e., choosing an employee to receive a monetary reward, job promotion or other favourable outcome), they should ensure that the procedures used to make the decision are fair. By ensuring that decision-making procedures are fair, an officer who has not received a job promotion, for example, is less likely to view the situation as unfair and their mental health is less likely to be negatively impacted as a result.

5.14.3 Implications for Organisations

Based on the findings of this thesis, it appears that in order for organisations to promote the mental health of employees, a preventative approach may be the most appropriate. In particular, the consistent relationships between job demands and indicators of mental health suggest that organisations should aim to minimise the level of stressors employees are exposed to in order to ensure their immediate and longer term health. Actively monitoring the pace, volume and complexity of job demands is likely to optimise employee health through ensuring that the demands being asked of an individual employee are not excessive. Although there was no evidence of curvilinearity in this thesis, organisations should be careful not to reduce job demands so much so that employees experience 'underload', which has the potential to be associated with poor health similar to situations of work overload.

In contrast to the direct effects of job demands found in this thesis, which suggest that minimising employee workloads will enhance employee health, the interaction effects found in this thesis suggest that job re-design does not necessarily mean reducing job demands. It

has been claimed that worker productivity and organizational output can be maintained (i.e., level of job demands remain unchanged) providing jobs are redesigned so that level of job control is enhanced, by allowing employees' significant decision making power about their tasks, increasing their influence about organisational matters, and allowing the employee discretion over the use of their skills (Karasek, 1979). In this thesis, the job demand by job control interaction was not significant. However, the job demand by job control by social support at work interaction was significant and Karasek's (1979) notions can be applied to the current findings. Re-designing jobs by increasing *both* job control and level of work-based social support may mean that employee workloads do not need to be reduced in order to optimise health. Increasing autonomy and social support may be more practical than reducing job demands for certain organisations, particularly smaller organisations where there are few employees and the workload cannot be decreased without fear of going out of business. Considering that the evidence for buffering effects is inconsistent however and may depend on the occupation in question, a reduction in job demands may be the first step to improving employee health due to being more likely to demonstrate commensurate changes in mental health.

Although the influence of organisational justice on health is not yet fully understood due to a lack of research in the area to date, the findings in the first study of this thesis imply that superiors within an organisation may perhaps benefit from considering the fairness of their actions due to the potential for justice perceptions to impact on employee mental health in the short term. The fair allocation of outcomes to employees, the use of fair decision making procedures and/or behaving towards employees in a manner that demonstrates respect

may not only be related to employee mental health, as they were in this thesis, but may also demonstrate relationships with other indicators of employee health.

In addition to organisational justice having the potential to impact on employee health, it is possible that the fair or unfair allocation of outcomes may also have an effect at the organisational level. Employees who perceive that they have been allocated an inequitable outcome may physically alter their input (i.e., reduce their input) to a level commensurate with the outcome (Cohen-Charash & Spector, 2001). Therefore, if employees deem the practices within their organisation to be unfair or unjust, the overall efficiency or productivity of the organisation may diminish due to the decreased volume of tasks being completed by employees. Further, organisational justice has been linked previously to outcomes such as organisational citizenship behaviours and organisational commitment (Cohen-Charash & Spector, 2001). Perceptions of organisational justice transgressions may consequently have the potential to result in staff dissociating from the organisation, and this in turn could perhaps result in employee turnover, for example. If organisations consider the fairness of practices, the health of their employees and the health of the organisation may both benefit.

Finally, human resource management (HRM) personnel within organisations may be able to promote the general health of their employees from keeping abreast of future research developments within the organisational justice field as they come to light and new links between justice and other health outcomes are discovered. Further, HRM staff may be able to filter messages about issues related to employee health throughout the organisation by relevant mission statements, providing regular training sessions to employees on health related issues and reflecting key messages in position descriptions with the hope of attracting new employees who support the initiatives of the organisation. Implementing mechanisms to

promote employee mental health that are preventative in nature may be most suitable in light of the long term effects of job demands.

5.15 Conclusion

The characteristics of an employee's job are well established as being key contributors to stress-related health outcomes, including poor mental health. Building upon the job characteristics that form the DCS model, this thesis incorporated the concept of organisational justice in order to compare the predictive ability of job characteristics and organisational justice in terms of a range of mental health indicators.

The strong performance of the DCS components across both context-specific and context-free mental health indicators provided support for the utility of this model as a means of investigating the effects of the work environment on the health of employees. One of the most notable findings of this thesis was that job demands appear to have adaptation effects that are detrimental to mental health. In particular, the effects of high job demands seemed to eventually overcome an employees' ability to adapt to workload pressures and employees eventually succumbed to poor mental health, in the form of psychological distress and poor psychological wellbeing. In contrast to job demands, the capacity for job-related resources, such as job control and/or social support to protect or enhance employee health was primarily restricted to short term amelioration, which was evidenced by the significant relationships at baseline that did not remain at one year follow-up. The capacity for organisational justice to contribute unique variance to employee mental health indicators appears to be similarly restricted to the short term. In particular, strategies aimed at improving distributive, interpersonal and informational fairness may be associated with concurrent job satisfaction.

The fair provision of outcomes to employees through just decision making procedures and treating employees with respect does not appear to have a long term impact on mental health however.

Through expanding the DCS model to include organisational justice, it appears that there is some limited potential for justice to enhance employee mental health. The unique effects of organisational justice were not consistently demonstrated across the spectrum of mental health outcomes. The inability of justice to consistently capture variance over and above the variance already attributed to job characteristics may suggest that justice is not as integral to employee health as job characteristics, with this result going against recent developments that have found justice to be the "new" more explanatory predictor of employee health. Further research into the influence of organisational justice on health outcomes is desirable in light of the relatively few studies that have been conducted in the area, in order to more fully understand the relationships between justice dimensions and employee health outcomes.

In terms of workplace health promotion programs, organisations that focus on minimising the level of demands employees face, through reducing workloads and providing flexible deadlines for example, are more likely to have a workforce comprised of mentally healthy employees. Considering that the effects of high job demands appear to be enduring, monitoring the level of job demands employees are exposed to needs to be an ongoing process throughout employment that will perhaps bring positive employee health over an extended period of time.

APPENDICES

Appendix A Ethics Approval 2005

Research Services

Office of the Deputy Vice-Chancellor (Research) (Melbourne Campus)

MEMORANDUM

TO: Dr Andrew Noblet
Health and Social Development Melbourne

cc:

FROM: Secretary, Deakin University Human Research Ethics Committee (DU-HREC)

DATE: 18 August 2005

SUBJECT: **PROJECT: EC 187-2004** (*Please quote this project number in future communication.*)

EXAMINING THE JOB STRESS ASSOCIATED WITH NEW PUBLIC SECTOR MANAGEMENT STRATEGIES

This application was considered at the DU-HREC meeting held on 15 August 2005.

APPROVAL HAS BEEN GIVEN FOR DR ANDREW NOBLET, SCHOOL OF HEALTH AND SOCIAL DEVELOPMENT, TO UNDERTAKE THIS PROJECT FROM 18 AUGUST 2005 TO 31 DECEMBER 2005.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the application and approval. It is your responsibility to contact the Secretary immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

V M Emery

Victoria Emery
Secretary, DU-HREC
(03) 9251 7123

Appendix B Ethics Approval 2006

Research Services

Office of the Deputy Vice-Chancellor (Research) (Melbourne Campus)

MEMORANDUM

TO: Dr Andrew Noblet
Deakin Business School Melbourne

cc:

FROM: Secretary, Deakin University Human Research Ethics Committee (DU-HREC)

DATE: 7 November 2006

SUBJECT: **PROJECT: EC 187-2004** (*Please quote this project number in future communication.*)

EXAMINING THE JOB STRESS ASSOCIATED WITH NEW PUBLIC SECTOR MANAGEMENT STRATEGIES

This application was for ratification of interim approval of modifications to a previously approved project.

APPROVAL HAS BEEN GIVEN FOR DR ANDREW NOBLET, DEAKIN BUSINESS SCHOOL, TO CONTINUE THIS PROJECT AS MODIFIED, UNTIL 18 AUGUST 2008.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Secretary immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HREC's.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

Vicki Xafis

Vicki Xafis
Secretary, DU-HREC
(03) 9251 7123

Appendix C Cover Letter to Participants

Victoria Police

Employee Attitude Survey

November 2005

This questionnaire will take approximately 30 minutes to complete.

Once you have completed this questionnaire, please seal it in the attached envelope and return to the address provided. Return of the survey will be regarded as consent to use the information for research purposes.

At the end of the survey, you are asked to provide your employee number. Providing your number is completely voluntary. If you do provide your employee number, it will form a code, which will help us to identify changes in employee perceptions over time. Only members of the Deakin University research team will see your survey responses, including your employee number. However, the researchers will not have access to employee names, and hence they will not be able to link your number with your name. Any feedback to Victoria Police will be reported in summary form only and individuals will not be identifiable in this information.

Please note that answering some of the questions presented in the questionnaire may result in some strong feelings. If this is the case, we strongly recommend that you discuss your feelings with someone who you feel comfortable with, such as a close friend, or for professional assistance, please contact Victoria Police Clinical Services Unit on 03 9301 6900. In addition employees may contact HR Support Line on 03 9247 3247, which is a 24 hour service including Employee Support & Welfare Program.

For all enquires please contact :
Marissa Deeble (Research Assistant), Deakin University, on Ph: 9244 5101, or email: marissa.deeble@deakin.edu.au, or
Julie Botten (Research Assistant), Deakin University, on Ph: 9244 5021, or email julie.botten@deakin.edu.au

Please complete and return this questionnaire by 30th of November, 2005.

Complete Survey & WIN (see last page for details)

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).

Appendix D Journal Article Arising from Thesis

Health Promotion International, Vol. 24 No. 3
doi:10.1093/heapro/dap025
Advance Access published 10 July, 2009

Promoting employee wellbeing: the relevance of work characteristics and organizational justice

KATRINA J. LAWSON*, ANDREW J. NOBLET and JOHN J. RODWELL
Faculty of Business and Law, Deakin Business School, Deakin University, Burwood, Australia
**Corresponding author. E-mail: kjla@deakin.edu.au*

SUMMARY

Research focusing on the relationship between organizational justice and health suggests that perceptions of fairness can make significant contributions to employee wellbeing. However, studies examining the justice–health relationship are only just emerging and there are several areas where further research is required, in particular, the uniqueness of the contributions made by justice and the extent to which the health effects can be explained by linear, non-linear and/or interaction models. The primary aim of the current study was to determine the main, curvilinear and interaction effects of work characteristics and organizational justice perceptions on employee wellbeing (as measured by psychological health and job satisfaction). Work characteristics were measured using the demand–control–support (DCS) model (Karasek and Theorell, 1990) and Colquitt's (2001) four justice dimensions (distributive, procedural, interpersonal and informational) assessed organizational justice (Colquitt, 2001). Hierarchical regression analyses found that in relation to psychological health, perceptions of justice added little to the explanatory power of the DCS model. In contrast, organizational justice did account for unique variance in job satisfaction, the second measure of employee wellbeing. The results supported linear relationships between the psychosocial working conditions and the outcome measures. A significant two-way interaction effect (control × support at work) was found for the psychological health outcome and the procedural justice by distributive justice interaction was significant for the job satisfaction outcome. Notably, the findings indicate that in addition to traditional job stressors, health promotion strategies should also address organizational justice.

Key words: workplace health promotion; employee wellbeing; organizational justice; job stress

INTRODUCTION

There is broad recognition in the workplace health promotion literature that psychosocial and organizational working conditions such as employee workloads, decision-making input and social support represent important avenues for protecting and promoting employee wellbeing [e.g. (Noblet 2003; Chu *et al*., 1997)]. An additional work characteristic, organizational justice, has recently been recognized as a 'new psycho-social predictor of health' that should also be taken into account when developing initiatives designed to prevent or reduce work-related ill-health (Elovainio *et al*., 2004, p. 1). There is a growing body of research-linking perceptions of injustice to a range of adverse health outcomes including lower wellbeing, increased depression and reduced job satisfaction (Kivimaki *et al*., 2004; Ylipaavalniemi *et al*., 2005). However, the majority of the research examining the justice–health relationship has been published since 2000 (Fujishiro and Heaney, 2007), and like any rapidly developing field, key elements of this relationship are yet to be fully investigated. For example, there is some uncertainty regarding the ability of fairness perceptions to account for variations in health outcomes after controlling for more established predictors of job stress (especially social support). Similarly, research in

this area has often assumed there is a direct, linear pathway between justice and health (i.e. where the health effects are proportional to the level of justice received), yet there are signs that interaction and non-linear effects may be involved. The current study aims to clarify the relationship between perceptions of justice and employee wellbeing by, first, assessing whether organizational justice contributes to employee wellbeing over and above the influence attributed to more established sources of job stress and, second, by testing for direct, interaction and non-linear effects of organizational justice dimensions. These analyses will not only help to determine whether organizational justice should be considered a key priority for people involved in developing workplace health promotion programs, but they will also shed light on how these conditions could be managed in order to improve health outcomes.

The demand–control–support (DCS) model

The more established job stressors examined in the current study will be measured using the demand–control–support (DCS) model (Karasek and Theorell, 1990). This model is one of the most widely used conceptual frameworks underpinning job stress research and has been found to have strong predictive capacity in a variety of occupational and industry contexts (De Lange *et al*., 2003). The DCS model proposes that high levels of job strain will be experienced when employees are faced with high job demands, and have relatively low levels of decision-making control and/or support to deal with those demands. Although there is mixed support for the interactions between demand, control and support, the results of cross-sectional and longitudinal research consistently provide strong evidence for the independent contributions of the component variables (see van der Doef and Maes 1999; de Lange *et al*., 2003 for reviews). We therefore expect the full DCS model (including direct and interaction effects) to provide a worthwhile reference point against which to measure the unique contributions of organizational justice.

Organizational justice: an independent predictor of health?

The term organizational justice is used to describe people's perception of fairness in organizations (Greenberg, 1990). That is, whether organizational justice is perceived as present or absent within the workplace is a subjective assessment (Colquitt *et al*., 2001; Tepper, 2001). The concept of justice consists of four main forms: distributive, procedural, informational and interpersonal justice (Colquitt *et al*., 2001). Distributive justice focuses on the individuals' perception of how fairly their 'inputs' (i.e. effort, experience and education) are rewarded in comparison to referent others (e.g. co-workers), while procedural justice refers to the perceived fairness of the procedures used to make justice-related decisions such as those involved in performance appraisals or promotion applications (Cohen-Charash and Spector, 2001). Studies have found that high levels of procedural fairness can off-set the negative effects of unfavorable distributive outcomes; a phenomenon sometimes referred to as the 'fair process effect' [e.g. (Greenberg and Folger, 1983; Shapiro and Brett, 1993)]. Interpersonal justice and informational justice (Greenberg, 1993), often seen as interactional forms of justice, refer to the interpersonal conduct and communication of the parties in charge of the resource allocation decisions (Bies and Moag, 1986; Cohen-Charash and Spector, 2001). Interpersonal justice focuses on the degree to which people are treated with respect and dignity, whereas informational justice refers to the extent to which employees receive timely and accurate information about the decision-making processes, or the outcomes of those processes (Colquitt, 2001).

In terms of studies testing the capacity of organizational justice to make independent contributions to employee health, findings generally indicate that perceptions of fairness provide unique insights into the work–health relationship. For example, Kivimaki *et al*. found that procedural and relational justice were independent predictors of a range of stress-related outcomes including self-rated health (Kivimaki *et al*., 2004), CHD risk scores (Kivimaki *et al*., 2005), minor psychiatric disorders (Elovainio *et al*., 2002), sickness absence (Kivimaki *et al*., 2003b) and depression (Ylipaavalniemi *et al*., 2005). Importantly, these relationships remained after adjusting for well-recognized psychosocial work stressors such as job demand, job control and, to a lesser extent, social support.

Although previous studies suggest that fairness perceptions account for variations in employee health that are independent of the

DCS components, there are two major limitations of such research that make it difficult to make this conclusion. The first limitation is that the previous justice–stress research has often not comprehensively assessed the two- (demand × control) or three-way (demand × control × support) DCS interactions and it is therefore difficult to assess the extent to which justice would contribute beyond the direct and interaction effects of this model. The second limitation involves the inconsistent application of social support. A proportion of justice–health studies have not assessed work-based support, or have focused on emotional support [e.g. (Elovainio *et al*., 2002; Kivimaki *et al*., 2003a)]. In contrast, the support-matching hypothesis suggests that the effectiveness of support is heavily dependent on the degree to which the form and source of support matches the specific needs activated by the stressor [e.g. (Cutrona, 1990; Sarason *et al*., 1990)]. Disaggregated measures of social support that tap into the commonly recognized forms (emotional, instrumental, informational and appraisal) and sources (supervisors, colleagues, subordinates) of support at work are hence more likely to predict employee health. The current study will address the limitations of previous justice–health research by testing whether the four organizational justice dimensions make independent contributions to employee wellbeing over and above the full DCS model (i.e. direct and interaction effects of demand, control and support). In addition, social support will be operationalized according to the disaggregated definition (i.e. assessing multiple forms and sources).

Testing for moderating and non-linear effects

Much of the previous research examining the relationship between perceptions of justice and health has focused on a direct relationship (i.e. where perceptions of justice or injustice lead to increases or decreases in health). In contrast, few justice–health studies have considered the capacity for procedural justice to off-set the negative effects of unfavorable distributive justice decisions; that is, the 'fair process effect' (Tepper 2001; Francis and Barling, 2005). Unfavorable distributive justice decisions are considered an inevitable part of modern work life (particularly in an era of faced-paced, unpredictable organizational change) and further clarification of the moderating effects of procedural justice would provide important insights into how justice-related decisions should be managed in order to minimize the associated fall-out. A key aim of the current study will be to address the lack of information on the buffering effects of procedural justice by testing for two-way procedural × distributive justice effects.

Another pathway that has been largely overlooked in the organizational justice literature, and is still uncommon in job stress research, is the possibility that psychosocial working conditions may have a non-linear relationship with health outcomes (Rydstedt *et al*., 2006). The non-linear effects of working conditions are supported theoretically [e.g. Warr's (1987) Vitamin model or Gardner's (1986) activation theory] and, while the job stress research has tended to focus on linear relationships between working conditions and outcome variables, there is empirical evidence suggesting that an under- or over-supply of conditions such as job demands and social support could have deleterious effects on employee wellbeing (De Jonge *et al*., 2000, Xie and Johns, 1995). However, this latter research has not considered the non-linear effects associated with organizational justice. Despite the negative effects of injustice are well documented, support for their curvilinearity would suggest that the positive effects of organizational fairness may be attenuated at high levels and/or that health and satisfaction would deteriorate when perceptions of justice are high. This being the case, practitioners would need to monitor employees' justice perceptions and be aware that efforts to improve perceptions of justice may have strong initial benefits, if initially inadequate, as well as diminishing returns if already high. The current investigation will test for curvilinear effects for the DCS and justice variables. In addition to the tests for DCS (demand × control; demand × control × support) and justice (distributive × procedural justice) interactions, the non-linear test will provide important information on how the working conditions examined in this study need to be modified in order to create fairer and less stressful working environments.

Measuring employee wellbeing

In the current study, psychological health and job satisfaction will be used to measure employee wellbeing. Both outcomes are

considered to be important dimensions of employee wellbeing and have been used in previous studies examining the relationship between working conditions and individual wellbeing [e.g. (De Jonge and Schaufeli, 1998, Noblet, 2003, Rydstedt *et al*., 2006)]. These dimensions are based on Warr's (1996) conceptualization of employee wellbeing whereby psychological health is regarded as a 'context-free' measure of wellbeing and, as such, provides an indication of people's wellbeing irrespective of the setting (i.e. work and non-work) (Warr, 1996). In contrast, job satisfaction is referred to as a 'context-specific' measure of employee wellbeing and conveys how people are feeling about themselves in relation to their job. Utilizing both these measures will therefore provide a more detailed understanding of the extent to which adverse working conditions may impact on particular dimensions of wellbeing.

METHODS

Sample

Members of a state-based police force in Australia were notified about the study and asked to fill out a survey. Participation was voluntary and ethics approval was obtained by the relevant bodies. The data used within the present study were drawn from one region, with 1764 sworn members, which included members of the police, recruits, PSOs and reservists. There were 587 respondents, representing a 33.3% response rate, and the respondents were aged as follows: 11.2% was 20–29 years, 31.7% was 30–39 years, 39.0% was 40–49 years, 17.5% was 50–59 years and 0.5% was aged 60 and over. Further, 77.5% of the participants were male and 22.5% were female. In terms of tenure, 1.4% had worked for the police force for less than 12 months, while at the other extreme, 42.1% of the total sample had worked within the police force for more than 20 years. Comparisons with personnel data were undertaken to determine the extent to which the sample was representative of all sworn members within the participating region. Breakdowns on the basis of age were not available; however, according to the gender and tenure profiles of the region, study participants were not significantly different from the larger workforce (e.g. for gender, $\chi^2(1) = 0.13$, ns).

Measures

The questionnaire used in this study consisted of three sections. The first section included scales to address the predictor variables, job demands, job control, social support and organizational justice, while the second section consisted of the outcome or target variables, psychological health and job satisfaction. The third section required respondents to supply the demographic information (i.e. gender, age and tenure).

Job demand

Participants completed an 11 item measure of workload developed by Caplan *et al*. (1980) to assess job demand, encompassing physical workload (i.e. how often does your job require you to work very fast?) and psychological demand (i.e. how much time do you have to think and contemplate?). The items were answered on a five-point Likert-type scale (1= 'rarely' and 5= 'very often') with higher scores indicating higher levels of job demand (Cronbach's alpha = 0.74).

Job control

A nine-item scale was used to measure participants' degree of job control (Karasek, 1985). Participants selected the most appropriate answer for each item on a five-point Likert-type scale (1= 'strongly disagree' to 5= 'strongly agree'). Higher scores indicate increased job control (Cronbach's alpha = 0.72).

Social support

Respondents indicated the extent to which they receive social support from work and non-work sources using a seven-point Likert-type scale (1= 'very little' to 7= 'very much'). These two scales were developed by Etzion (1984) and incorporated multiple forms (e.g. emotional, instrumental and appraisal) and sources (e.g. supervisors, co-workers, family and friends) of support. Higher scores on these scales indicate greater support (Cronbach's alpha = 0.86 for support at work and 0.88 for non-work support).

Organizational justice

Employees' perceptions of organizational justice were assessed with Colquitt's (2001) four justice scales, using a total of 20 items (Colquitt,

2001). Seven of the items pertain to procedural justice (Cronbach's alpha = 0.84), four to distributive justice (Cronbach's alpha = 0.86), another four to interpersonal justice (Cronbach's alpha = 0.92) and five to informational justice (Cronbach's alpha = 0.91). Items were scored according to a five-point Likert-type scale (1= 'very often' to 5= 'rarely'). Participants' scores on each scale indicate the extent to which they perceived each type of organizational justice within their workplace. Higher scores on each scale were indicative of higher perceived justice.

Psychological health

The 12-item version of the General Health Questionnaire (Goldberg and Williams, 1988) was used to assess psychological health. The items were scored on a four-point Likert-type scale (0= 'much less than usual' to 3= 'more so than usual') and items summed to create an overall psychological health score for each participant. Higher scores indicated more positive psychological wellbeing (Cronbach's alpha = 0.91).

Job satisfaction

A 16-item scale was used to determine employees' perceived levels of job satisfaction (Warr *et al*., 1979). The items were measured on a seven-point Likert-type scale (1= 'extremely satisfied' to 7='extremely dissatisfied') and high scores indicate high job satisfaction (Cronbach's alpha = 0.88).

RESULTS

All data were screened and analyzed using SPSS Version 15. Data for the total sample was examined for input errors, missing values and outliers (following Tabachnick and Fiddell, 2001). Cases with outliers identified through Mahalanobis' distance were deleted. After removing outliers and missing data, psychological health had $n = 546$ and job satisfaction had $n = 555$. Further checks found that one of the variables, job control, needed to have a reflect and square root transformation for the analysis onto psychological health. The seven predictor variables (job control, demand, support at work, non-work support, procedural, distributive, interpersonal and informational justice) were 'centered', whereby the means for each variable were subtracted from each participant's score (Aiken and West, 1991) before they were included in the interaction and squared terms. The squared terms were included in the step before the interaction terms, to more strictly test the interaction effects by removing nonessential multicollinearity (Cohen *et al*., 2003).

Table 1 summarizes the means and standard deviations for each variable, as well as correlations between the study variables. Demand had a small to moderate significant negative correlation with psychological health and job satisfaction. Job control and work-based support were both correlated to psychological health and job satisfaction, although these associations were relatively small for wellbeing ($r = 0.168$ and $r = 0.370$, respectively) compared to job satisfaction ($r = 0.468$ and $r = 0.658$ respectively). Non-work-based social support had a small to moderate positive correlation with psychological health and job satisfaction. All four types of organizational justice were significantly correlated with psychological health and job satisfaction. Finally, the correlation between the two outcome measures (job satisfaction and psychological health) was significant, indicating that higher levels of the work-specific measure of wellbeing were associated with higher levels of context-free wellbeing.

Two separate hierarchical multiple regressions were undertaken to assess the independent contributions made by the justice dimensions and to test for linear, non-linear and interaction effects. The overall equations displayed in Table 2 significantly explained the variance in psychological health, $R^2_{adj} = 0.139$, $F(24,\ 407) = 3.893$, $p < 0.001$ and job satisfaction, $R^2_{adj} = 0.564$, $F(24,\ 402) = 23.961$, $p < 0.001$. The results of these analyses indicate that the majority of the explained variance in both measures of employee wellbeing was attributed to the DCS variables. Although the main effects of the four justice dimensions failed to account for additional variance when examining psychological health, some of the additive effects of the justice dimensions were significant for job satisfaction. Job demand had a significant negative main effect on psychological health and job satisfaction. Work-based social support, positively predicted both psychological health and job satisfaction. Although job control was not significantly related to

Table 1: Correlations between work characteristics, organizational justice, psychological health and job satisfaction

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1. Job control	31.78	4.47									
2. Demand	39.12	5.02	0.065								
3. Support at work	39.03	9.73	0.296**	−0.258**							
4. Support outside work	47.72	9.73	0.119**	−0.086*	0.508**						
5. Procedural justice	16.07	5.22	0.229**	−0.096*	0.423**	0.253**					
6. Distributive justice	9.48	4.00	0.098	−0.241**	0.362**	0.163**	0.522**				
7. Interpersonal justice	13.65	3.79	0.301**	−0.022	0.360**	0.150**	0.469**	0.337**			
8. Informational justice	14.43	4.80	0.269**	−0.079	0.426**	0.169**	0.550**	0.426**	0.703**		
9. Psychological health	22.64	6.24	0.168**	−0.295**	0.370**	0.236**	0.181**	0.146**	0.180**	0.226**	
10. Job satisfaction	68.55	13.63	0.468**	−0.297**	0.658**	0.292**	0.491**	0.485**	0.432**	0.508**	0.452**

*$p < 0.05$, **$p < 0.01$.

psychological health, it did predict job satisfaction. The association between non-work support and the two measures of wellbeing failed to reach significance. Similarly, none of the four forms of justice (i.e. distributive, procedural, interpersonal and informational) demonstrated significant main effects when regressed against psychological health. However, distributive justice, interpersonal justice and informational justice were significantly associated with job satisfaction.

In relation to the proposed DCS and justice interactions, one of the two-way interaction effects (control × support at work) was significantly related to the psychological health variable and the distributive × procedural justice interaction was significantly related to job satisfaction. There was no evidence of curvilinear relationships.

DISCUSSION

The aims of the present study were to (i) determine the extent to which organizational justice contributes unique variance to employee wellbeing over and above more established sources of job stress (e.g. demand, control and support), and (ii) identify the nature of the relationship between the psychosocial working conditions (represented in the DCS and organizational justice models) and employee wellbeing, by measuring for direct, interaction and non-linear effects. Although the proportion of variance in psychological health attributed to organizational justice was not significant, the justice variables added to the explanatory power of the DCS for job satisfaction. In terms of the nature of the relationships between the working conditions and individual wellbeing, the results generally support direct, linear pathways between the psychosocial work characteristics and the measures of wellbeing. The curvilinear effects were not evident in the present study; however, two significant interaction effects were found. In particular, one DCS interaction effect was significantly related to psychological health and the sole organizational justice interaction effect was significantly related to job satisfaction. The theoretical and practical implications of the specific findings will be discussed in the following sections.

The independent contribution of organizational justice

Overall, the regression analyses indicate that perceptions of organizational justice were a much stronger predictor of the work-specific measure of job satisfaction than they were when examining the context-free measure of psychological health. It was expected that psychosocial working conditions would capture larger portions of the variance in job satisfaction, as this outcome specifically describes how people feel about themselves in relation to their work (Rydstedt *et al.*, 2006). Nevertheless, the inability of justice to capture a significant proportion of the variance in psychological health is in contrast to previous justice–health research where perceptions of fairness predicted mental health measures even after controlling for the effects of traditional stressors such as job demands and job control [e.g. (Elovainio *et al*

Table 2: Summary of hierarchical regression analysis for variables predicting psychological health and job satisfaction

	Psychological health			Job satisfaction		
	B	SE B	β	B	SE B	β
Step 1						
Demand	−0.216	0.066	−0.163**	−0.523	0.099	−0.190***
Job control	−0.857	0.469	−0.091	0.816	0.117	0.252***
Support at work	0.126	0.040	0.186**	0.536	0.061	0.374***
Support outside work	0.054	0.036	0.082	−0.059	0.054	−0.042
ΔR^2			0.132			0.478
Step 2						
Demand^2	−0.019	0.011	−0.085	−0.007	0.017	−0.016
Job control^2	−0.022	0.014	−0.079	0.019	0.022	0.032
Support at work^2	0.002	0.003	0.028	0.002	0.005	0.016
Support outside work^2	0.000	0.003	0.004	−0.007	0.004	−0.063
ΔR^2			0.010			0.004
Step 3						
Job control × demand	0.027	0.017	0.080	0.043	0.024	0.067
Job control × support at work	0.038	0.011	0.211***	−0.018	0.016	−0.050
Job control × support outside work	−0.013	0.009	−0.074	0.002	0.014	0.005
Workload × support at work	0.010	0.010	0.062	−0.012	0.014	−0.034
Workload × support outside work	−0.008	0.008	−0.054	0.009	0.011	0.029
ΔR^2			0.030			0.005
Step 4						
Job control × demand × support at work	0.000	0.002	−0.010	0.002	0.003	0.020
Job control × demand × support outside work	0.002	0.002	0.037	−0.001	0.003	−0.013
ΔR^2			0.001			0.000
Step 5						
Procedural justice	0.004	0.074	0.003	0.148	0.113	0.057
Distributive justice	−0.113	0.092	−0.071	0.638	0.139	0.192***
Interpersonal justice	0.008	0.110	0.005	0.328	0.167	0.092*
Informational justice	0.093	0.091	0.069	0.379	0.140	0.132**
ΔR^2			0.007			0.093
Step 6						
Procedural justice^2	−0.020	0.014	−0.095	−0.016	0.021	−0.035
Distributive justice^2	−0.006	0.024	−0.015	−0.058	0.033	−0.074
Interpersonal justice^2	0.006	0.020	0.018	0.057	0.030	0.078
Informational justice^2	−0.005	0.013	−0.021	−0.019	0.020	−0.037
ΔR^2			0.007			0.004
Step 7						
Procedural justice × distributive justice	0.006	0.025	0.019	0.071	0.036	0.109*
ΔR^2			0.000			0.004

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

2004; Francis and Barling 2005)]. The lack of effect of organizational justice on psychological health may be due, in part, to an important operational difference between the current investigation and previous justice–health research. Specifically, the measure of social support used in the current study assessed multiple sources (e.g. supervisors and colleagues) and multiple forms (e.g. emotional, instrumental and appraisal) of support. This disaggregated approach is in contrast to the emotion-focused measure adopted in a number of previous studies in this area [e.g. (Elovainio *et al* 2002; Kivimaki *et al*., 2003a)] and may explain why the beta values for work-based support were relatively strong (Table 2). Moreover, the inclusion of the disaggregated social support measures may be one of the key reasons why, after accounting for the DCS conditions, the justice dimensions failed to account for additional variance in the psychological health variable. Unfair outcomes or treatment may still have an impact on job satisfaction, because they are more workplace oriented. However, the consequences of injustice may not be severe or persistent enough to have a discernable impact

on context-free measures of health once the full DCS has been taken into account.

The relatively weak connection between the justice variables and psychological health in the regression results should not diminish the importance of the justice–satisfaction relationship. The majority of working adults spend between one- and two-thirds of their waking hours at work and thus the level of satisfaction they derive from their job can have a large impact on their overall quality of life (Murphy and Cooper, 2000). Both the DCS variables and organizational justice were closely associated with job satisfaction and hence the results of this study suggest that both sets of variables need to be taken into account when developing strategies that can help create more satisfying workplaces.

The influence of individual DCS variables

The multiple regression results involving both psychological health and job satisfaction provided strong support for the individual DCS variables—demand, control and social support. Not only were the additive effects of these three variables significant, but all were significant for at least one of the outcome variables. Work-based social support predicted both psychological health and job satisfaction, suggesting that support provided by supervisors and colleagues can offer valuable opportunities for protecting and enhancing employee wellbeing. In terms of specific strategies to boost social support, the results of this and other research indicate the there is a need for managers, human resource personnel and workplace health professionals to ensure that employees have access to multiple forms (emotional, appraisal, instrumental and informational) and sources (supervisors and colleagues) of support [e.g. (Cutrona 1990; Noblet 2003)]. Direct supervisors, in particular, need to have the capacity to provide this more adaptable style of support as they are often the ones who have the authority and the expertise to address many of the challenges faced by employees.

Job demands predicted both psychological health and job satisfaction. The relationship between demand and the two indicators of employee wellbeing were in the expected direction, with high demands being negatively related to mental health and job satisfaction. This result parallels previous research involving job demands [e.g. (Jeurissen and Nyklieck, 2001)] and indicates that the pace, volume and complexity of the demands faced by employees should be monitored to ensure these do not undermine the wellbeing of employees. The remaining DCS dimension, job control, was closely associated with job satisfaction, although, in a similar manner to a number of other studies, it did not predict psychological health [e.g. (Akerboom and Maes, 2006)]. This result suggests that providing employees with the opportunity for greater skill discretion and decision-making authority may provide important benefits for employees' job satisfaction.

The direct effects of organizational justice on employee wellbeing

Unlike previous studies examining the relationship between organizational justice and employee-level outcomes [e.g. (Schmitt and Dorfel, 1999; Cohen-Charash and Spector 2001)], the present study included all four dimensions of fairness (i.e. distributive, procedural, interpersonal and informational). Three of the fairness dimensions—distributive, interpersonal and informational justice—predicted the context-specific measure of employee wellbeing. The significant relationship between these forms of justice and job satisfaction suggests that employees' are more likely to be satisfied with their jobs if they: (i) perceive they are being fairly rewarded, (ii) believe they are being interacted with in a respectful manner and (iii) receive timely and accurate explanations about the processes leading to the justice-related decision (Colquitt, 2001). There are a number of strategies organizations can adopt in order to promote distributive, interpersonal and informational fairness including; ensuring that equity (rewarding employees based on their contributions) and equality (maintaining reasonable levels of parity between employees) are taken into account when distributing resources such as promotions, bonuses or new work roles; providing all employees involved in a particular justice-related decision with accurate information about the decision-making processes; and giving employees and explanations as to why decision outcomes may have been delayed and carrying out these processes in a friendly manner that is respectful to employees (Cropanzano *et al.*, 2007). Although these strategies are directly

aimed at increasing perceptions of fairness, the findings from this and previous studies indicate they are likely to also enhance job satisfaction (Cohen-Charash and Spector, 2001; Judge and Colquitt, 2004).

Non-linear and interaction effects

The relationships between the psychosocial conditions represented in the current study and the outcome variables were linear. That is, increases or decreases in a certain condition were associated with proportional increases or decreases in the outcome measures. In addition to the significant direct main effects of the DCS components and certain types of organizational justice found in this study, there was also evidence of interaction effects.

The present study tested for both two-way and three-way DCS interaction effects. For the psychological health target variable, the two-way interaction between job control and work-based social support was significant. This result suggests that these two conditions work in a combination to enhance the mental health of employees. For example, a high level of control over work tasks for someone with high levels of support at work would provide an extra 'bonus'-like benefit in terms of psychological health. Further, this interaction effect suggests that if organizations have to make a choice between allowing employees greater control over their work or alternatively, providing them with a more supportive working environment, they can focus health promotion strategies on first improving social support (because it also has a positive main effect). Similarly, the lack of a significant main effect between control and the context-free measure of wellbeing indicates that focusing purely on increasing the number of opportunities for employees to choose their own work tasks may not necessarily lead to improved psychological health.

Although none of the DCS interaction terms were significantly related to job satisfaction, the procedural justice by distributive justice interaction effect was significant for job satisfaction. The significant relationship between these two types of organizational justice indicates that the positive benefits from the distributive justice main effects can be given a boost when there are also high levels of procedural justice. In a manner similar to previous research, the significant procedural by distributive justice interaction effect appears to indicate that employees who consider the outcomes allocated, or not allocated, to them as unfair will be less dissatisfied if they perceive that the decision-making procedures to decide the allocation of outcomes were carried out in a fair manner [e.g. (Greenberg and Folger, 1983; Shapiro and Brett, 1993)]. This result is particularly relevant to contemporary organizations, as it is difficult to satisfy candidates who have all applied for the same job promotion, for instance, as only one person can be allocated the position. By ensuring that decision-making procedures are fair however, individuals finding themselves in such a circumstance may be more forgiving of the unfavorable decision.

There are two limitations that need to be kept in mind when interpreting the results of the current study. We utilized a cross-sectional study design involving employees from one occupational group (uniformed law enforcement officers). Future research in this area would therefore benefit from testing the combined DCS-justice model across time and with employees from multiple occupations and sectors. Further, due to reliance on self-report data obtained from the same source, for both the predictor and target variables, common method variance is a possibility (Podsakoff and Organ, 1986). However, the latter limitation is more relevant to the target variables, wherein additional objective measures of the outcome variables would have enhanced the validity of the findings.

CONCLUSION

The results of the present study indicate that there is some potential for focusing on organizational justice as a means of protecting and enhancing employee wellbeing. In particular, the strong performance of the DCS across both psychological health and job satisfaction suggests that there would be a considerable value in using this framework and building on this foundation to include organizational justice. Strategies aimed at improving distributive, interpersonal and informational fairness may be particularly useful in achieving higher levels of job satisfaction. Further, processes that consider procedural justice may offset the negative effects of decisions that employees perhaps

deem as low on distributive justice. Overall, the present study has provided additional support for the health promoting potential of the DCS, but more importantly, the findings have added to the growing research base linking organizational justice with employee wellbeing.

FUNDING

This project was part-funded by the Australian Research Council.

REFERENCES

Aiken, L. S. and West, S. G. (1991) *Multiple Regression: Testing and Interpreting Interactions*. Sage, Newbury Park, CA.

Akerboom, S. and Maes, S. (2006) Beyond demand and control: the contribution of organizational risk factors in assessing the psychological well-being of health care employees. *Work and Stress*, **20**, 21–36.

Bies, R. J. and Moag, J. S. (1986) Interactional justice: communication criteria of fairness. In Lewicki, R. J., Sheppard, B. H. and Bazerman, M. Z. (eds), *Research on negotiations in organizations*, **1**, 43–55. JAI Press, Greenwich, CT.

Caplan, R. D., Cobb, S., French, J., Harrison, R. V. and Pinneau, S. R. (1980) *Job demands and worker health*. Institute for Social Research, Ann Arbor, MI.

Chu, C., Driscoll, T. and Dwyer, S. (1997) The health-promoting workplace: an integrative perspective. *Australian and New Zealand Journal of Public Health*, **21**, 377–385.

Cohen, J., Cohen, P., West, S. G. and Aiken, L. S. (2003) *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. 3rd edn. Lawrence Erlbaum Associates Inc, Mahwah, NJ.

Cohen-Charash, Y. and Spector, P. E. (2001) The role of justice in organizations: a meta-analysis. *Organizational Behavior and Human Decision Processes*, **86**, 278–321.

Colquitt, J. A. (2001) On the dimensionality of organizational justice: a construct validation of a measure. *Journal of Applied Psychology*, **86**, 386–400.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. and Yee Ng, K. (2001) Justice at the millennium: a meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology*, **86**, 425–445.

Cropanzano, R., Bowen, D. E. and Gililand, S. W. (2007) The management of organizational justice. *Academy of Management Perspectives*, **21**, 34–45.

Cutrona, C. E. (1990) Stress and social support: in search of optimal matching. *Journal of Social and Clinical Psychology*, **9**, 3–14.

De Jonge, J. and Schaufeli, W. B. (1998) Job characteristics and employee well-being: a test of Warr's vitamin model in health care workers using structural equation modeling. *Journal of Organizational Behavior*, **19**, 387–407.

De Jonge, J., Reuvers, M., Houtman, I., Bongers, P. M. and Kompier, M. (2000) Linear and nonlinear relations between psychosocial characteristics, subjective outcome and sickness absence: Baseline results from SMASH. *Journal of Occupational Health Psychology*, **5**, 256–268.

De Lange, A. H., Taris, T. W., Kompier, M. A., Houtman, I. L. and Bongers, P. M. (2003) The very best of the millennium: Longitudinal research and the Demand-Control-(Support) model. *Journal of Occupational Health Psychology*, **8**, 282–305.

Elovainio, M., Kivimaki, M. and Vahtera, J. (2002) Organizational Justice: evidence of a new psychosocial predictor of health. *American Journal of Public Health*, **92**, 105–108.

Elovainio, M., Kivimaki, M., Steen, N. and Vahtera, J. (2004) Job decision latitude, organizational justice and health: multilevel covariance structure analysis. *Social Science and Medicine*, **58**, 1659–1669.

Etzion, D. (1984) Moderating effect of social support on the stress-burnout relationship. *Journal of Applied Psychology*, **69**, 615–622.

Francis, L. and Barling, J. (2005) Organizational injustice and psychological strain. *Canadian Journal of Behavioural Science*, **37**, 250–261.

Fujishiro, K. and Heaney, C. A. (2007) Justice at work, job stress, and employee health. *Health Education and Behavior*, pre-published November 15, DOI: 10.1177/1090198107306435.

Gardner, D. (1986) Activation theory and task design: an empirical test of several new predictions. *Journal of Applied Psychology*, **71**, 411–418.

Goldberg, D. and Williams, P. (1988) *GHQ: Users Guide to the General Health Questionnaire*. NFER-Nelson, Windsor.

Greenberg, J. (1990) Organizational justice: yesterday, today and tomorrow. *Journal of Management*, **16**, 399–432.

Greenberg, J. (1993) Stealing in the name of justice: informational and interpersonal moderators of theft reactions to underpayment inequity. *Organizational Behavior and Human Decision Processes*, **54**, 81–104.

Greenberg, J. and Folger, R. (1983) Procedural justice, participation, and the fair process effect in groups and organizations. In Paulus, P. (ed.), *Basic Group Processes*. Springer-Verlag, New York, pp. 235–256.

Jeurissen, T. and Nyklieck, I. (2001) Testing the vitamin model of job stress in Dutch healthcare workers. *Work and Stress*, **15**, 254–264.

Judge, T. A. and Colquitt, J. A. (2004) Organizational justice and stress: the mediating role of work- family conflict. *Journal of Applied Psychology*, **89**, 395–404.

Karasek, R. A. (1985) *Job Content Questionnaire and User's Guide.* University of Massachusetts Lowell, Department of Work Environment, Lowell.

Karasek, R. and Theorell, T. (1990) *Healthy Work. Stress, Productivity and the Reconstruction of Working Life*. Basic Books, New York.

Kivimaki, M., Elovaino, J., Virtanen, M. and Stansfeld, S. A. (2003a) Association between organizational inequality and incidence of psychiatric disorders in female employees. *Psychological Medicine*, **33**, 319–326.

Kivimaki, M., Head, J., Ferrie, J. E., Shipley, M. J., Vahtera, J. and Marmot, M. (2003b) Sickness absence as a global measure of health: Evidence from all-cause mortality in the Whitehall II study. *British Medical Journal*, **327**, 364–369.

Kivimaki, M., Ferrie, J. E., Head, J., Shipley, M. J., Vahtera, J. and Marmot, M. G. (2004) Organizational justice and change in justice as predictors of employee

health: the Whitehall II study. *Journal of Epidemiology and Community Health*, **58**, 931–937.

Kivimaki, M., Ferrie, J. E., Brunner, E., Head, J., Shipley, M. J., Vahtera, J. *et al.* (2005) Justice at work and reduced risk of coronary heart disease among employees. The Whitehall II Study. *Archives of Internal Medicine*, **165**, 2245–2251.

Murphy, L. and Cooper, C. (eds) (2000) *Healthy and Productive Work: An International Perspective*. Taylor and Francis, London.

Noblet, A. (2003) Building health promoting work settings: identifying the relationship between work characteristics and occupational stress in Australia. *Health Promotion International*, **18**, 351–359.

Podsakoff, P. M. and Organ, D. W. (1986) Self-reports in organizational research: problems and prospects. *Journal of Management*, **12**, 531–544.

Rydstedt, L. W., Ferrie, J. and Head, J. (2006) Is there support for curvilinear relationships between psychosocial work characteristics and mental wellbeing? Cross-sectional and long term data from the Whitehall II study. *Work and Stress*, **20**, 6–20.

Sarason, I. G., Sarason, B. R. and Pierce, G. R. (1990) Social support: the search for theory. *Journal of Social and Clinical Psychology*, **9**, 133–147.

Schmitt, M. and Dorfel, M. (1999) Procedural injustice at work, justice sensitivity, job satisfaction and psychosomatic wellbeing. *European Journal of Social Psychology*, **29**, 443–453.

Shapiro, D. and Brett, J. M. (1993) Comparing three processes underlying judgements of procedural justice: A field study of mediation and arbitration. *Journal of Personality and Social Psychology*, **65**, 1167–1177.

Tabachnick, B. G. and Fidell, L. S. (2001) *Using Multivariate Statistics*. 4th edn. Allyn and Bacon, Massachusetts.

Tepper, B. T. (2001) Health consequences of organizational justice: tests of main and interactive effects. *Organizational Behavior and Human Decision Processes*, **86**, 197–215.

Van der Doef, M. and Maes, S. (1999) The job demand-control(-support) model and psychological wellbeing: a review of 20 years of empirical research. *Work and Stress*, **13**, 87–114.

Warr, P. (1987) *Work, Unemployment, and Mental Health*. Oxford University Press, Oxford.

Warr, P. B. (1996) Employee well-being. In Warr, P. (ed.), *Psychology at Work*. Penguin Books, London, pp. 224–253.

Warr, P. B., Cook, J. and Wall, T. (1979) Scales for the measurement of some work attitudes and aspects of psychological wellbeing. *Journal of Occupational Psychology*, **52**, 129–148.

Xie, J. L. and Johns, G. (1995) Job scope and stress: can job scope be too high? *Academy of Management Journal*, **38**, 1288–1309.

Ylipaavalniemi, J., Kivimaki, M., Elovainio, M., Virtanen, M., Keltikangas-Jarvinen, L. and Vahtera, J. (2005) Psychosocial work characteristics and incidences of newly diagnosed depression: a prospective cohort study of three different models. *Social Science and Medicine*, **61**, 111–122.

Appendix E List of Conference Papers Arising from Thesis

Lawson, K., Rodwell, J. & Noblet, A. **The Longitudinal Impact of Job Demands on Mental Health.** Paper presented at the International Employment Relations Association/IERA Conference June 2011.

Lawson, K.J., Rodwell, J.J. & Noblet, A. **Raising the Profile of Depression in the Workplace.** Paper presented at the Australian and New Zealand Academy of Management (ANZAM) Conference December 2009.

Lawson, K.J., Rodwell, J.J. & Noblet, A. **The Demand Model and Certain Types of Organizational Justice Predict Employee Wellbeing.** Paper presented at the British Academy of Management (BAM) conference September 2009.

Lawson, K.J., Rodwell, J.J. & Noblet, A. **The Impact of Workload on Wellbeing, Mental Health and Depression: A Longitudinal Study of Work Perceptions.** Paper presented at (Australian) Industrial and Organisational Psychology (IOP) Conference June 2009.

Lawson, K.J., Noblet, A., & Rodwell, J.J. **Promoting Health in the Public Sector: The Applicability of Demands on Employee Health Outcomes**. Paper presented at the Pacific Employment Relations Association (PERA) Conference November 2008.

REFERENCES

Aaron, J. D. K. (2000). Stress and coping in police officers. *Police Quarterly, 3*, 438-450.

Abbott, A. (2001). *Chaos of Disciplines*. Chicago: The University of Chicago Press.

Abdollahi, M. K. (2002). Understanding police stress research. *Journal of Forensic Psychology Practice, 2*, 1-24.

Ackroyd, S., Kirkpatrick, L., & Walker, R. (2007). Public management reform in the UK and its consequences for professional organization: A comparative analysis. *Public Administration, 85*(1), 9-26.

Adcroft, A., & Willis, R. (2005). The (un)intended outcome of public sector performance measurement, *International Journal of Public Sector Management, 18*(5), 386-400.

Ainsworth, P. B. (2002). *Psychology and Policing*. Devon, UK: Willan Publishing

Akerboom, S., & Maes, S. (2006). Beyond demand and control: The contribution of organizational risk factors in assessing the psychological well-being of health care employees. *Work & Stress, 20*(1), 21-36.

Akobeng, A. K. (2007). Understanding diagnostic tests 3: Receiver operating characteristic curves, *Acta Paediatrica, 96*, 644-647.

Ambrose, M. L., & Arnaud, A. (2005). Are procedural justice and distributive justice conceptually distinct? In J. Greenberg & J. A. Colquitt (Eds.), *Handbook of Organizational Justice* (pp. 59-84). New Jersey: Erlbaum.

Amick, B. C., & Celentano, D. D. (1991). Structural determinants of the psychosocial environment: Introducing technology in the work stress framework. *Ergonomics, 34*, 625-646.

Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler Psychological Distress Scale (K10). *Australian and New Zealand Journal of Public Health, 25*(6), 494-497.

Anshel, M. H., Robertson, M., & Caputi, P. (1997). Sources of acute stress and their appraisals and reappraisals among Australian police as a function of previous experience. *Journal of Occupational and Organizational Psychology, 70*, 337-356.

Australian Bureau of Statistics (1997). *National Health Survey, Summary of Results, Australia 1995*. Canberra: ABS.

Australian Bureau of Statistics (2003). *Information Paper: Use of Kessler Psychological Distress Scale in ABS Health Surveys, Australia 2001*. from http://www.abs.gov.au/Ausstats/abs@.nsf/Lookup/B9ADE45ED60E0A1CCA256D2D0000A288.

Australian Bureau of Statistics (2006). *National Health Survey: Summary of Results, 2004-05*.

Australian Bureau of Statistics (2008). *National Survey of Mental Health and Wellbeing: Summary of Results, 2007*. from http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/6AE6DA447F985FC2CA2574EA00122BD6/$File/43260_2007.pdf.

Australian Bureau of Statistics (2009). *Australian social trends, March 2009*. from http://www.abs.gov.au/ausstats/abs@.nsf/mf/4102.0.

Australian Institute of Health and Welfare (2008). *Australia's Health 2008*. from http://www.aihw.gov.au/publications/aus/ah08/ah08.pdf.

Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress, 22*(3), 187-200.

Barnett, R. C., & Brennan, R. T. (1997). Change in job conditions, change in psychological distress, and gender: A longitudinal study of dual-earner couples. *Journal of Organizational Behavior, 18*, 253-274.

Beehr, T. A., Bowling, N. A., & Bennett, M. M. (2010). Occupational stress and failures of social support: When helping hurts. *Journal of Occupational Health Psychology, 15*(1), 45-59.

Beehr, T. A., Glaser, K. M., Canali, K. G., & Wallwey, D. A. (2001). Back to basics: Re-examination of demand-control theory of occupational stress. *Work & Stress, 15*, 115-130.

Begg, S., Vos, T., Barker, B., Stevenson, C., Stanley, L., & Lopez, A. (2007). *The Burden of Disease and Injury in Australia 2003* from *www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=6442459747*

Beyond Blue: The National Depression Initiative (2008). *Research: Target Research in Depression, Anxiety and Related Disorders 2001-2007* from http://www.beyondblue.org.au/index.aspx?link_id=6.993

Bhagat, R. S., O'Driscoll, M. P., Babakus, E., Frey, L., Chookar, J., Ninokumar, B. H., et al. (1994). Organizational stress and coping in seven national contexts: A cross-cultural investigation. In G. P. Keita (Ed.), *Job Stress in a Changing Workforce: Investigating Gender, Diversity, and Family Issues* (pp. 93-105). Washington: American Psychological Association.

Bicknell, M., & Liefooghe, A. (2010). Enjoy your Stress! Using Lacan to enrich transactional models of stress. *Organization, 17*(3), 317-330.

Bies, R. J., & Moag, J. F. (1986). Interactional justice: Communication criteria of fairness. In R. J. Lewicki, B. H. Sheppard & M. H. Bazerman (Eds.), *Research on Negotiations in Organizations* (pp. 43-55). Greenwich, CT: JAI Press.

Bosma, H., Marmot, M., Hemmingway, H., Nicholson, A., Brunner, E., & Stansfeld, S. (1997). Low control and risk of coronary disease in Whitehall II (prospective cohort) study. *British Medical Journal, 314*, 558-565.

Bourbonnais, R., Comeau, M., & Vezina, M. (1999). Job strain and evolution of mental health among nurses. *Journal of Occupational Health Psychology, 4*, 95-107.

Brockner, J., & Wisenfeld, B. M. (1996). An integrative framework for explaining reactions to decisions: Interactive effects of outcomes and procedures. *Psychological Bulletin, 120*, 189-208.

Bromet, E. J., Dew, M. J., Parkinson, M. S., & Schulberg, H. C. (1988). Predictive effects of occupational and marital stress on the mental health of a male workforce. *Journal of Organizational Behavior, 9*, 1-13.

Brough, P. (2004). Comparing the influence of traumatic and organizational stressors on the psychological health of police, fire, and ambulance officers. *International Journal of Stress Management, 11*(3), 227-244.

Brown, J., & Campbell, E. (1990). Sources of occupational stress in police. *Work & Stress, 4*, 305-318.

Burke, K. J. (2009). *Adjusting To Life 'On The Beat': A Longitudinal Examination of Adaptation To The Police Profession.* University of Tasmania, Tasmania.

Burke, K. J., & Paton, D. (2006). Predicting police officer job satisfaction: Traditional versus contemporary models of trauma in occupational experience. *Traumatology, 12*(3), 189-197.

Buunk, B. P. (1990). Affiliation and helping interactions within organizations: A critical analysis of the role of social support with regard to occupational stress In W. Stroebe & M. Hewstone (Eds.), *European Review of Social Psychology* (Vol. 1, pp. 293-322). Chichester: John Wiley.

Buunk, B. P., de Jong, J., Ybema, J. F., & de Wolff, C. J. (1998). Psychosocial aspects of occupational stress. In P. J. D. Drenth, H. K. Thierry & C. J. de Wolff (Eds.), *Handbook of Work and Organizational Psychology* (pp. 145-182). Hove: Psychology Press.

Buunk, B. P., Doosje, B. J., Jans, L. G. J. M., & Hopstaken, L. E. M. (1993). Perceived reciprocity, social support, and stress at work: The role of exchange and communal orientation. *Journal of Personality and Social Psychology, 65*, 801-811.

Chen, W., Siu, O., Lu, J., Cooper, C. L., & Phillips, D. R. (2009). Work stress and depression: the direct and moderating effects of informal social support and coping. *Stress and Health, 25*(5), 431-443.

Clarke, D., & Currie, K. (2009). Depression, anxiety and their relationship with chronic diseases: A review of epidemiology, risk and treatment evidence. *Medical Journal of Australia, 190*(7), 54-60.

Cohen-Charash, Y., & Spector, P. E. (2001). The role of justice in organizations: A meta-analysis. *Organizational Behavior and Human Decision Processes, 86*(2), 278-321.

Cohen, S., & Wills, T. (1985). Stress, social support and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357.

Colquitt, J. A. (2001). On the dimensionality of organizational justice: A construct validation of a measure. *Journal of Applied Psychology, 86*(3), 386-400.

Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H., & Yee Ng, K. (2001). Justice at the millennium: A meta-analytic review of 25 years of organizational justice research. *Journal of Applied Psychology, 86*(3), 425-445.

Cooper, C. L., & Dewe, P. (2004). *Stress: A Brief History*. Cornwall: Blackwell Publishing.

Cooper, C., & Marshall, J. (1976). Occupational sources of stress: A review of the literature relating to coronary heart disease and mental ill health. *Journal of Occupational Psychology, 49*(1), 11-28.

Cotton, P. (1995). The major types of psychological dysfunction in workplace settings. In P. Cotton (Ed.), *Psychological Health in the Workplace: Understanding and Managing Occupational Stress*. Carlton: Australian Psychological Society.

Cox, T. (1985). Repetitive work: Occupational stress and health. In C. Cooper & M. J. Smith (Eds.), *Job Stress and Blue Collar Work* (pp.85-112). Great Britain: John Wiley & Sons Ltd.

Cox, T., & Griffiths, A. (1995). The nature and measurement of work stress: Theory and practice. In J. R. Wilson & E. N. Corlett (Eds.), *Evaluation of Human Work: A Practical Ergonomics Methodology* (pp. 783-803). London: Taylor & Francis.

Cox, T., Thirlaway, M., Gotts, G., & Cox, S. (1983). The nature and assessment of general wellbeing. *Journal of Psychosomatic Research, 27*, 353-359.

Coyne, J. C. (1994). Self-reported distress: analog or ersatz depression? *Psychological Bulletin, 116*(1), 29-45.

Cutrona, C. E. (1990). Stress and social support: In search of optimal matching. *Journal of Social and Clinical Psychology, 9*, 3-14.

Daniels, K., & Guppy, A. (1994). Occupational stress, social support, job control, and psychological wellbeing. *Human Relations, 12*, 1523-1544.

Danna, K., & Griffin, R. W. (1999). Health and well-being in the work-place: A review and synthesis of the literature. *Journal of Management, 25*(3), 357-384.

Dantzer, M. J. (1987). Police-related stress a critique for future research. *Journal of Police Criminal Psychology, 3*, 43-48.

Dantzker, M. J., & Surrette, M. A. (1996). The perceived levels of job satisfaction among police officers: A descriptive review. *Journal of Police Criminal Psychology, 11*(2), 7-12.

Davey, J. D., Obst, P. L., & Sheehan, M. C. (2001). Demographic and workplace characteristics which add to the prediction of stress and job satisfaction with the police workplace. *Journal of Police and Criminal Psychology, 16*(1), 29-39.

de Boer, E. M., Bakker, A. B., Syroit, J. E., & Schaufeli, W. B. (2002). Unfairness at work as a predictor of absenteeism. *Journal of Organizational Behavior, 23*, 181-197.

de Jonge, J., Le Blanc, P. M., Schaufeli, W. B., & van der Linden, S. (1998). Changes in job characteristics as related to changes in burnout and job satisfaction. *Gedrag en Organisatie, 11*, 121-134.

de Jonge, J., Reuvers, M. l. M. E. N., Houtman, I. L. D., Bongers, P. M., & Kompier, M. A. J. (2000). Linear and nonlinear relations between psychosocial job characteristics, subjective outcomes, and sickness absence: Baseline results from SMASH. *Journal of Occupational Health Psychology, 5*(2), 256-268.

de Jonge, J., Schaufeli, W. B., & Furda, J. (1995). 'Werkkenmerken: psychologische arbeidsvitamines?' [Job characteristics: psychological work vitamins?]. *Gedrag en Organisatie, 8*(4), 231-248.

de Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L., & Bongers, P. M. (2003). The very best of the millennium: Longitudinal research and the demand-control-(support) model. *Journal of Occupational Health Psychology, 8*(4), 282-305.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*(3), 499-512.

Dohrenwend, B. S., & Dohrenwend, B. P. (1981). Life stress and illness: Formulation of the issues In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), *Stressful Life Events and Their Contexts* (pp. 1-27). New York: Prodist.

Donath, S. (2001). The validity of the 12-item general health questionnaire in Australia: A comparison between three scoring methods. *Australian & New Zealand Journal of Psychiatry, 35*, 231-235.

Edwards (1991). Person-job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper & T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 283-357). Chichester Wiley.

Elovainio, M., Kivimaki, M., & Helkman, K. (2001). Organizational justice evaluations, job control, and occupational strain. *Journal of Applied Psychology, 86*(3), 418-424.

Elovainio, M., Kivimaki, M., & Vahtera, J. (2002). Organizational justice: Evidence of a new psychosocial predictor of health. *American Journal of Public Health, 92*(1), 105-108.

Elovainio, M., & Sinervo, T. (1997). Psychosocial stressors at work, psychological stress and musculoskeletal symptoms in the care for the elderly. *Work & Stress, 11*(4), 351-361.

Etzion, D. (1984). Moderating effect of social support on the stress-burnout relationship, *Journal of Applied Psychology, 69*, 615-622.

Etzion, D., & Westman, M. (1994). Social support and sense of control as moderators of the stress-burnout relationship in military careers. *Journal of Social Behavior and Personality, 9*(4), 639-656.

Fawcett, T. (2006). An introduction to ROC analysis. *Pattern Recognition Letters, 27*, 861-874.

Fisher, S. (1985). Control and blue collar work. In C. L. Cooper & M. J. Smith (Eds.), *Job Stress and Blue Collar Work* (pp. 19-50). Great Britain: John Wiley & Sons Ltd.

Fletcher, B., & Jones, F. (1993). A refutation of Karasek's demand-discretion model of occupational stress with a range of dependent measures. *Journal of Organizational Behavior, 14*, 319-330.

Fluss, R., Faraggi, D., & Reiser, B. (2006). Estimation of the Youden index and its associated cutoff point. *Biometrical Journal, 47*(4), 458-472.

Folkman, S., Schaefer, C., & Lazarus, R. S. (1980). Cognitive processes as mediators of stress and coping. In V. Hamilton & D. M. Warburton (Eds.), *Human stress and Cognition*. Chicester: Wiley & Sons.

Frankenhauser, M. (1980). Psychoneuroendocrine Approaches to the Study of Stressful Person-Environment Transactions. In H. Selye (Ed.), *Selye's Guide to Stress Research* (pp. 47-70). New York: Van Nostrand Reinhold Company.

French, J. R. P., Caplan, R. D., & Harrison, R. V. (1982). *The Mechanisms of Job Stress and Strain*. Chichester: Wiley.

Fujishiro, K., & Heaney, C. A. (2007). Justice at work, job stress, and employee health. *Health Education and Behavior, 36*(3), 487-504.

Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian national survey of mental health and well-being. *Psychological Medicine, 33*(02), 357-362.

Gaillard, A. W. K. (1993). Comparing the concepts of mental load and stress. *Ergonomics, 9*, 991-1005.

Gaillard, A. W. K., & Wientijes, C. J. E. (1994). Mental load and work stress as two types of energy mobilization. *Work & Stress, 8*(2), 141-152.

Gallie, D., Felstead, A., & Green, F. (2004). Changing patterns of task discretion in Britain. *Work, Employment and Society, 18*(2), 243-266.

Ganzach, Y. (1997). Misleading interaction and curvilinear terms. *Psychological Methods, 2*(3), 235-247.

Ghaziniour, M., Lauritz, L. E., Du Preez, E., Cassimjee, N., & Richter, J. (2010). An investigation of mental health and personality in Swedish police trainees upon entry to the police academy. *Journal of Police Criminal Psychology, 25*, 34-42.

Gill, S. C., Butterworth, P., Rodgers, B., & Mackinnon, A. (2007). Validity of the mental health component scale of the 12-item short-form health survey (MCS-12) as measure of common mental disorders in the general population. *Psychiatry Research, 152*(1), 63-71.

Greenberg, J. (1990). Organizational justice: Yesterday, today and tomorrow. *Journal of Management, 16*, 399-432.

Greenberg, J., & Colquitt, J. A. (Eds.). (2005). *Handbook of Organizational Justice*. New Jersey: Lawrence Erlbaum Associates Inc.

Greenberg, J., & Folger, R. (1983). Procedural justice, participation, and the fair process effect in groups and organisations. In P. Paulus (Ed.), *Basic Group Processes* (pp. 235-256). New York: Springer-Verlag.

Gutierres, S. E., Sanenz, D. S., & Green, B. L. (1994). Job stress and health outcomes among White and Hispanic employees: A test of the person-environment fit model. In G. P. Keita (Ed.), *Job Stress in a Changing Workforce: Investigating Gender, Diversity, and Family Issues* (pp. 107-125). Washington: American Psychological Association.

Halbesleben, J. R. B. (2006). Sources of social support and burnout: A meta-analytic test of the conservation of resources model. *Journal of Applied Psychology, 91*(5), 1134-1145.

Hart, P. M. (1999). Predicting employee life satisfaction: A coherent model of personality, work and non-work experiences, and domain satisfaction. *Journal of Applied Psychology, 84*, 564-584.

Hartley, T. A., Violanti, J. M., Fekedulegn, D., Andrew, M. E., & Burchfiel, C. M. (2006). Associations between major life events, traumatic incidents and depression among Buffalo police officers. *International Journal of Emergency Mental Health, 9*, 25-35.

Hausser, J. A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the job demand-control (-support) model of psychological well-being. *Work & Stress, 24*(1), 1-35.

Heaney, C. A., & Israel, B. A. (1997). Social networks and social support. In K. Glanz, F. M. Lewis & B. K. Rimer (Eds.), *Health Behavior and Health Education: Theory, Research, and Practice* (pp. 179-205). San Francisco: Jessey-Bass.

Hegtvedt, K. A., Johnson, C., Ganem, N. M., Waldron, K. W., & Brody, L. M. (2009). When will the unaffected seek justice for others? Perceptions of and responses to another's injustice. *Australian Journal of Psychology, 61*(1), 22-31.

Heponiemi, T., Elovainio, M., Kivimaki, M., Pulkki, L., Puttonen, S., & Keltikangas-Jarvinen, L. (2006). The longitudinal effects of social support and hostility on depressive tendencies. *Social Science & Medicine, 63*, 1374-1382.

Hinkle, L. E. (1977). The concept of "stress" in the biological and social sciences. In Z. J. Lipowski, D. R. Lipsitt & P. C. Whybrow (Eds.), *Psychosomatic Medicine: Current Trends and Clinical Applications* (pp. 27-49). New York: Oxford University Press.

Hobfoll, S. E. (1988). *The Ecology of Stress.* New York: Hemisphere.

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *American Psychologist, 44*(3), 513-524.

Hodgins, G. A., Creamer, M., & Bell, R. (2001). Riskfactors for posttrauma reactions to police officers: a longitudinal study. *The Journal of Nervous and Mental Disease, 189*(8), 541-547.

Holmes, T. H., & Masuda, M. (1974). Life change and illness susceptibility. In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), *Stressful Life Events: Their Nature and Effects* (pp. 45-72). New York: John Wiley & Sons Ltd.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment scale. *Journal of Psychosomatic Research, 11*, 213-218.

Holroyd, K. A., & Lazarus, R. S. (1982). Stress, coping and somatic adaptation. In L. Goldberger & S. Breznitz (Eds.), *Handbook of Stress*. New York: Free Press.

House, G S (1981) *Work Stress and Social Support.* Reading, MA Addison-Wesley.

House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen & S. L. Syme (Eds.). *Social Support & Health*. (pp. 83-108). New York: Academic Press.

Hsieh, F., & Turnbull, B. W. (1996). Nonparametric methods for evaluating diagnostic tests. *Statistica Sinica, 6*, 47-62.

Jackson, S. E. (1989). Does job control control job stress? In S. L. Sauter, J. J. Hurrell & C. L. Cooper (Eds.), *Job Control and Worker Health*. New York: John Wiley & Sons.

Janssen, O. (2001). Fairness perceptions as a moderator in the curvilinear relationships between job demands, and job performance and job satisfaction. *Academy of Management Journal, 44*(5), 1039-1050.

Jeurissen, T., & Nyklicek, I. (2001). Testing the vitamin model of job stress in Dutch health care workers. *Work & Stress, 15*(3), 254-264.

Johnson, J. V., Hall, E. M., Ford, D. E., Mead, L. A., Levine, D. M., Y., W. N., et al. (1995). The psychosocial work environment of physicians: The impact of demands and resources on job dissatisfaction and psychiatric distress in a longitudinal study of Johns Hopkins Medical School graduates. *Journal of Occupational and Environmental Medicine, 37*, 1151-1159.

Johnson, J. V., Johansson, G. (Eds.). (1991). *The Psychosocial Work Environment: Work Organization, Democratization and Health*. Amityville: Baywood Publishing Company Inc.

Jones, F., & Fletcher, B. (2003). Job control, physical health and psychological well-being. In M. J. Schabracq, J. A. M. Winnubst & C. L. Cooper (Eds.), *The Handbook of Work and Health Psychology* (pp. 121-142). West Sussex: John Wiley & Sons.

Jones, F., & Kinman, G. (2001). Approaches to studying stress. In F. Jones & J. Bright (Eds.), *Stress: Myth, theory and research* (pp. 17-45). England: Prentice-Hall.

Judge, T. A., & Colquitt, J. A. (2004). Organizational justice and stress: the mediating role of work-family conflict. *Journal of Applied Psychology, 89*(3), 395-404.

Kahn, R. L., & Byosiere, P. (1992). Stress in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology* (pp. 571-650). California: Consulting Psychologists Press Inc.

Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. D., & Rosenthal, R. A. (1964). *Organizational Stress: Studies in Role Conflict and Ambiguity*. New York: John Wiley & Sons Inc.

Kanner, A., Coyne, J., Schaefer, C., & Lazarus, R. L. (1981). Comparisons of two models of stress management: Daily hassles and uplifts versus major life events. *Journal of Behavioral Medicine, 4*(1), 1-39.

Karasek, R. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24*(2), 285-308.

Karasek, R., & Theorell, T. (1990). *Healthy work. Stress, Productivity and the Reconstruction of Working Life*. New York: Basic Books.

Kasl, S. V. (1973). Mental health and the work environment: An examination of the evidence. *Journal of Occupational Medicine, 15*(6), 509-518.

Kasl, S. V. (1978). Epidemiological contributions to the study of work stress. In C. L. Cooper & R. Payne (Eds.), *Stress at Work* (pp. 3-48). Chichester: John Wiley and Sons.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripe, E., Mroczek, D. K., Normand, S. L. T., et al. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*(06), 959-976.

Kivimaki, M., Elovainio, M., Vahtera, J., Virtanen, M., & Stansfeld, S. (2003). Association between organizational inequity and incidence of psychiatric disorders in female employees. *Psychological Medicine, 33*, 319-326.

Kivimaki, M., Ferrie, J. E., Brunner, E., Head, J., Shipley, M. J., Vahtera, J., et al. (2005). Justice at work and reduced risk of coronary heart disease among employees. The Whitehall II study. *Archives of Internal Medicine, 165*, 2245-2251.

Kivimaki, M., Ferrie, J. E., Head, J., Shipley, M. J., Vahtera, J., & Marmot, M. G. (2004). Organizational justice and change in justice as predictors of health: The Whitehall II study. *Journal of Epidemiology and Community and Health, 58*, 931-937.

Kohn, M. L., & Schooler, C. (1982). Job conditions and personality: A longitudinal assessment of their reciprocal effects. *American Journal of Sociology, 87*, 1257-1286.

Kompier, M. (2003). Job Design and Well-being. In M. J. Schabracq, J. A. M. Winnubst & C. L. Cooper (Eds.), *The Handbook of Work and Health Psychology*. West Sussex: John Wiley & Sons.

Koslowksy, M., Caspy, T., & Lazar, M. (1991). Cause and effect explanations of job satisfaction and commitment: The case of exchange commitment. *The Journal of Psychology, 125*(2), 153-162.

LaMontagne, A., Keegel, T., Vallance, D., Ostry, A., & Wolfe, R. (2008). Job strain - attributable depression in a sample of working Australians: Assessing the contribution to health inequalities. *BMC Public Health, 8*(181), 1471-2458.

Langlieb, A. M., & DePaulo, J. R. (2008). Etiology of depression and implications on work environment. *Journal of Occupational and Environmental Medicine, 50*(4), 391-395.

Lanuay, G., & Fielding, P. J. (1989). Stress among prison officers: Some empirical evidence based on self report. *Howard Journal of Criminal Justice, 28*, 138-148.

Lazarus, Cohen, J. B., Folkman, S., Kanner, A., & Schaefer, C. (1980). Psychological stress and adaptation: Some unresolved issues. In H. Selye (Ed.), *Selye's Guide to Stress Research* (pp. 91-117). New York: Van Nostrand Reinhold Company.

Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. United States of America: McGraw-Hill Inc.

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

Lazarus, R. S., DeLongis, A., Folkman, A,. & Gruen, R. (1985). Stress and adaptational outcomes: The problem of confounded measures. *American Psychologist, 40*(7), 770-779.

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

Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment on burnout and organizational commitment. *Journal of Organizational Behavior, 9*, 297-308.

Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of Industrial and Organisational Psychology* (pp. 1297-1350). USA: Rand McNally College Publishing Company.

Loi, R., Yang, J., & Diefendorff, J. M. (2009). Four-factor justice and daily job satisfaction: A multi-level investigation. *Journal of Applied Psychology, 94*(3), 770-781.

Love, P. E. D., Irani, Z., Standing, C., & Themistocleous, M. (2007). Influence of job demands, job control and social support on information systems professionals' psychological wellbeing. *International Journal of Manpower, 28*(6), 513-528.

Mackinnon, A., Jorm, A. F., & Hickie, I. B. (2004). A national depression index for Australia. *Medical Journal of Australia, 181*(7), S52-56.

Macklin, D., Smith, G., & Dollard, M. F. (2006). Public and private sector work stress: Workers compensation, levels of distress and the demand-control-support model *Australian Journal of Psychology, 58*(3), 130-143.

Maslach, C., & Leiter, M. P. (1997). *The Truth About Burnout: How Organizations Cause Personal Stress and What to Do About it*. San Fransisco, CA: Jossey-Bass.

Mausner-Dorsch, H., & Eaton, W. W. (2000). Psychosocial work environment and depression: Epidemiologic assessment of the demand-control model. *American Journal of Public Health, 90*(11), 1765-1770.

McHugh, M., & Brennan, S. (1994). Managing the stress of change in the public sector. *International Journal of Public Sector Management, 7*, 29-41.

Muntaner, C., Tien, A. Y., Eaton, W. W., & Garrison, R. (1991). Occupational characteristics and the occurence of psychotic disorders. *Social Psychiatry and Psychiatric Epidemiology, 26*(6), 273-280.

Noblet, A. J., Rodwell, J. J., & McWilliams, J. (2006). Organisational change in the public sector: Augmenting the demand control model to predict employee outcomes under new public management. *Work & Stress, 20*(4), 335-352.

North, C. S., Pollio, D. E., Pfefferbaum, B., Medgivern, D., Vythilingham, M., Westerhaus, E. T., et al. (2005). Capitol hill staff workers' experiences of bioterrorism: Qualitative findings from focus groups. *Journal of Traumatic Stress, 18*(1), 79-88.

Nurse, L., & Devonish, D. (2007). Grievance management and its links to workplace justice. *Employee Relations, 29*(1), 89-109.

Pallant, J. (2002). *SPSS Survival Manual: A Step By Step Guide to Data Analyses using SPSS* (2nd ed.). NSW, Australia: Allen & Unwin.

Parker, S. K., Turner, N., & Griffin, M. A. (2003). Designing healthy work. In N. Schmitt, M. Frese & J. George (Eds.), *Health and Safety in Organizations: A Multi-level Perspective* (pp. 91-130). San Francisco: Jossey-Bass.

Parker, S. K., Wall, T. D., & Corderey, J. L. (2001). Future work design research and practice: Towards an elaborated model of work design. *Journal of Occupational and Organizational Psychology, 74*, 413-440.

Parkes, K. R., Mendham, C. A., & Rabenau, C. V. (1994). Social support and the demand and discretion model of job stress: Tests of additive and interactive effects in two samples. *Journal of Vocational Behavior, 44*(1), 91-113.

Pascual, E., Perez-Jover, V., Mirambell, E., Ivanez, G., & Terol, M. C. (2003). Job conditions, coping and wellness/health outcomes in Spanish secondary school teachers. *Psychology & Health, 18*(4), 511-521.

Pasillas, R. M., Follette, V. M., & Perumean-Chaney, S. E. (2006). Occupational stress and psychological functioning in law enforcement officers. *Journal of Police and Criminal Psychology, 21*(1), 41-53.

Paton, D., & Flin, R. (1999). Disaster stress: An emergency management perspective. *Disaster Prevention and Management, 8*, 261-267.

Paton, D., Violanti, J. M., & Burke, K. (2009). *Traumatic Stress in Police Officers: A Career-Length Assessment from Recruitment to Retirement*. Springfield: Charles C Thomas Publisher, LTD.

Patterson, B. L. (1992). Job experience and perceived job stress among police, correctional, and probation/parole officers. *Criminal Justice and Behavior, 19*(3), 260-285.

Penk, W., Drebing, C., & Schutt, R. (2002). PTSD in the workplace. In J. C. Thomas & M. Hersen (Eds.), *Handbook of Mental Health in the Workplace* (pp. 215-248). Thousand Oaks, California: SAGE Publications.

Peterson, W. W., Birdsall, T. G., & Fox, W. C. (1954). The theory of signal detectability. *Proceedings of the IRE, 4*, 171-212.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531-544.

Podsakoff, P. M. MacKenzie, S. B., Lee, J. Y. and Podsakoff, N. P. 2003. Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology 88*, 879-903.

Pyszczynski, T., Hamilton, J. C., & Herring, F. H. (1989). Depression, self-focused attention, and the negative memory bias. *Journal of Personality and Social Psychology, 57*(2), 351-357.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.

Rissler, A., & Elgerot, A. (1978). *Stress Reactions Related to Overtime at Work.* Stockholm, Department of Psychology, University of Stockholm.

Rutter, M. (1988). Longitudinal data in the study of causal processes: Some uses and some pitfalls. In M Rutter (Ed.) *Studies of Psychosocial Risk: The Power of Longitudinal Data*. Cambridge University Press, Cambridge.

Rydstedt, L. W., Ferrie, J., & Head, J. (2006). Is there support for curvilinear relationships between psychosocial work characteristics and mental well-being? Cross-sectional and long-term data from the Whitehall II study. *Work & Stress, 20*(1), 6 - 20.

Salanova, M., Piero, J., & Schaufeli, W. B. (2002). Self-efficacy specificity and burnout among information technology workers: An extension of the demand control model. *European Journal of Work and Organizational Psychology, 11*, 1-25.

Santor, D. A., & Coyne, J. C. (1997). Shortening the CES-D to improve its ability to detect cases of depression. *Psychological Assessment, 9*(3), 233-243.

Sarason, I. G., Sarason, B. R., & Pierce, G. R. (1990). Social support: The search for theory. *Journal of Social and Clinical Psychology, 9*, 133-147.

Schmitt, M., & Dorfel, M. (1999). Procedural injustice at work, justice sensitivity, job satisfaction and psychosomatic wellbeing. *European Journal of Social Psychology, 29*, 443-453.

Schnall, P. L., Landisbergis, P. A., & Baker, D. (1994). Job strain and cardiovascular disease. *Annual Review of Public Health, 15*, 381-411.

Schultz, K. S., Wang, M., & Olson, D. A. (2009). Role overload and underload in relation to occupational stress and health. *Stress and Health, 26*, 99-111.

Schwartz, J. E., Pickering, T. G., & Landisbergis, P. A. (1996). Work-related stress and blood pressure: Current theoretical models and considerations from a behavioral medicine perspective. *Journal of Occupational Health Psychology, 1*(3), 287-310.

Schwarzer, R., & Knoll, N. (2007). Functional roles in social support within the stress and coping process: A theoretical and empirical overview. *International Journal of Psychology 42*(4), 243-252.

Selye, H. (1936). A syndrome produced by diverse nocuous agents. *Nature, 138*, 32.

Selye, H. (1951). The general-adaptation syndrome. *Annual Reviews in Medicine, 2*, 327-342.

Selye, H. (1956). *The Stress of Life.* New York: McGraw-Hill Book Company.

Selye, H. (1974). *Stress Without Distress*. Aylesbury: Compton Printing Ltd.

Selye, H. (1975). Confusion and controversy in the stress field. *Journal of Human Stress, 1* (2), 37-44.

Sewell, J. D. (1983). Development of a critical life events scale for law enforcement. *Journal of Police Science and Administration, 11*(1), 109-116.

Shane, J. M. (2010). Organizational stressors and police performance. *Journal of Criminal Justice, 38*(4), 807-818.

Shapiro, D., & Brett, J. M. (1993). Comparing three processes underlying judgements of procedural justice: A field study of mediation and arbitration. *Journal of Personality and Social Psychology, 65*, 1167-1177.

Slate, R. N., Johnson, W. W., & Colbert, S. S. (2007). Police stress: A structural model. *Journal of Police Criminal Psychology, 22*, 102-112.

Slate, R. N., Wells, T. L., & Johnson, W. W. (2003). Opening the manager's door: State probation officer stress and perceptions of participation in workplace decision-making. *Crime and Delinquency, 43*(4), 519-541.

Spell, C. S., & Arnold, T. J. (2007). A multi-level analysis of organizational justice climate, structure, and employee mental health. *Journal of Management, 33*(5), 724-751.

Spielberger, C. D. (1976). The nature and measurement of anxiety. In C. D. Spielberger & R. Diaz-Guerrero (Eds.), *Cross Cultural Anxiety*. Washington DC: Hemisphere.

Stets, J. E. (1995). Job autonomy and control over one's spouse: a compensatory process. *Journal of Health and Social Behavior, 36*, 244-258.

Sutinen, R., Kivimaki, M., Elovainio, M., & Virtanen, M. (2002). Organizational fairness and psychological distress in hospital physicians *Scandinavian Journal of Work, Environment & Health, 30*, 209-215.

Swets, J. A. (1988). Measuring the accuracy of diagnostic systems. *Science, 240*(4857), 1285-1293.

Tepper, B. J. (2001). Health consequences of organizational injustice: Tests of main and interactive effects. *Organizational Behavior and Human Decision Processes, 86*(2), 197-215.

Thoits, P. (1983). Dimensions of life events as influences upon genesis of psychological distress and associated conditions: An evaluation and synthesis of the literature. In H. Kaplan (Ed.), *Psychological Stress: Trends in Theory and Research*. New York: Academic Press.

Thomas, J. C., & Hite, J. (2002). Mental health in the workplace: Toward an integration of organizational and clinical theory, research, and practice. In J. C. Thomas & M. Hersen (Eds.), *Handbook of Mental Health in the Workplace* (pp. 3-14). Thousand Oaks, California: SAGE Publications.

Tummers, G. E. R., Van Merode, G. G., & Landeweerd, J. A. (2002). The diversity of work: Differences, similarities and relationships concerning characteristics of the organization, the work and psychological work reactions in intensive care and non-intensive care nursing. *International Journal of Nursing Studies, 39*, 841-855.

Vaananen, A., Vahtera, J., Pentti, J., & Kivimaki, M. (2005). Sources of social support as determinants of psychiatric morbidity after severe life events *Journal of Psychosomatic Research, 58*, 459-467.

Van den Bos, K. (2005). What is responsible for the fair process effect? In J. Greenberg & J. A. Colquitt (Eds.), *Handbook of Organizational Justice* (pp. 273-300). London: Lawrence Erlbaum Associates.

van der Doef, M., & Maes, S. (1999). The job demand-control(-support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress, 13*(2), 87-114.

Verhoeven, C., Kraaij, V., Joekes, K., & Maes, S. (2003). The job demand-control-social support model and wellness/health outcomes in Dutch secondary school teachers. *Psychology & Health, 18*(4), 421-440.

Victorian Health Promotion Foundation (2006). *Summary of the Evidence Base for Mental Health Promotion*. from http://www.vichealth.vic.gov.au/~/media/ProgramsandProjects/MentalHealthandWellBeing/Publications/Attachments/HS591_evidence_based_info_2A.ashx.

Violanti, J. M. (1983). Stress patterns in police work: A longitudinal study. *Journal of Police Science and Administration, 11*, 211-216.

Waghorn, G., Chant, D., White, P., & Whiteford, H. (2005). Disability, employment and work performance among people with ICD-10 anxiety disorders. *Australian & New Zealand Journal of Psychiatry, 39*, 55-66.

Warr, P. B. (1987). *Work, Unemployment and Mental Health*. Oxford: Clarendon Press.

Warr, P. B. (1990). Decision latitude, job demands, and employee well-being. *Work & Stress, 4*(4), 285-294.

Wiili-Peltola, E., Kivimaki, M., Elovainio, M., & Virtanen, M. (2007). Organisational justice and employee perceptions on hospital management. *Journal of Health Organization Management, 21*(3), 320-332.

Winnubst, J. A. M., Marcelissen, F. H. G., & Kleber, R. J. (1982). Effects of social support in the stressor-strain relationship: A Dutch sample. *Social Science and Medicine, 16*, 475-482.

Ybema, J. F., & van den Bos, K. (2010). Effects of organizational justice on depressive symptoms and sickness absence: A longitudinal perspective. *Social Science & Medicine, 70*(10), 1609-1617.

Ylipaavalniemi, J., Kivimaki, M., Elovainio, M., Virtanen, M., Keltikangas-Jarvinen, L., & Vahtera, J. (2005). Psychosocial work characteristics and incidence of newly diagnosed depression: a prospective cohort study of three different models. *Social Science and Medicine, 61*, 111-122.

Youden, W. J. (1950). Index for rating diagnostic tests. *Cancer, 3*, 32-35.

Zegans, L. (1982). Stress and the development of somatic disorders. In L. Goldberger & S. Breznitz (Eds.), *Handbook of Stress: Theoretical and Clinical Aspects* (pp. 134-152). London: Free Press.

Zohar, D. (1995). The justice perspective of job stress. *Journal of Organizational Behavior, 16*, 487-495.