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**IMPACT OF WORK DESIGN ON PSYCHOLOGICAL WORK
REACTIONS AND JOB PERFORMANCE AMONG TECHNICAL
WORKERS: A LONGITUDINAL STUDY IN MALAYSIA**



THE UNIVERSITY OF
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ABSTRACT

Work design has long been found to affect employee well-being, but scholars have begun to question whether the established theoretical relations regarding work design continue to hold given the enormous changes in the nature of work during the past two decades. It is increasingly recognised that social characteristics affect work behaviours in substantial ways, and recent theorising proposes that individual differences are also important. Few studies on work design have investigated these factors together. In addition, little is known about whether existing Western findings regarding the effects of work design generalise to non-Western cultures.

This thesis built upon to the Job Demands-Resources (JD-R) model of work design, to test the impact of work design on employee well-being in Malaysia, a country characterised as collectivistic and having high power distance. Specifically, my research sought to examine, cross-sectionally and longitudinally, the direct effects of psychosocial work characteristics on psychological strain. Also, the present study assessed the moderating effects of job resources variables including job control, social support, and self-efficacy on the relationships between job demands and psychological strain. Finally, this study examined the mediation effect of psychological strain on the relationships between work design variables and work attitude outcomes (i.e. job satisfaction, affective commitment, and turnover intentions), as well as the mediation effects of these work attitudes on the relationship between psychological strain and job performance.

This research involved a non-experimental two-wave panel survey design with a six-month time interval. Self-reports on the study variables were obtained from 429 technical workers at Time 1 and 245 at Time 2 in a large telecommunication company in Malaysia. I used multivariate analyses to examine the direct and moderating effects hypotheses, and structural equation modeling (SEM) to assess the mediation effects hypotheses.

The findings confirmed the direct effects of job demands, job control, social support, and self-efficacy on psychological strain. However, the results failed to support the Job Demands Control (JDC) model in this Malaysian context. Indeed, the combination of high job demands and high job control increased, rather than reduced, psychological strain in this Malaysia setting. The results also provide evidence for a moderating effect of supervisor support, but not for perceived organisational support or co-worker support. Overall, the results did provide some support for the Job Demands Control Support (JDCS) model. Furthermore, they demonstrated a moderating effect of self-efficacy. In the mediation analyses, psychological strain (especially anxiety/depression) functioned as a mediator between work design variables and work attitudes. In subsequent mediation analyses, job satisfaction, affective commitment, and turnover intentions mediated the effect of psychological strain on job performance, particularly in the cross-sectional analyses.

This research makes several theoretical contributions, and provides information concerning the JD-R model and its application to a culture characterised by high collectivism and high power distance. The findings may help human resource practitioners understand how work design influences employees' well-being and performance. Implications are discussed to enhance better mapping of interventions at individual and group levels. Recommendations for future research include the need to test an expanded model of work design and well-being using multi-wave longitudinal designs and multiple measures of key variables.

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Verily, with every difficulty, there is relief
(Al Inshira: 6).

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CHAPTER 1

INTRODUCTION

Background and Problem Statements to the Research

This research focuses on how work design affects employee well-being. Work design has generated much interest in recent decades (Fried, Grant, Levi, Hadani, & Slowik, 2007). It is defined as the attributes of the task, job, and social and organisational environment (Humphrey, Nahrgang, & Morgeson, 2007). Work design describes how jobs, tasks, and roles are structured, performed, and modified, as well as the impact of these structures, enactments, and modifications on individual, group, and organisational outcomes (Grant & Parker, 2009). It has an enormous impact on organisational success and individual well-being (Morgeson & Campion, 2003). Work design has been shown to influence behavioural outcomes (such as performance and absenteeism), psychological outcomes (such as job satisfaction and stress), and physical outcomes (such as blood pressure and cardiovascular disease) (Grant & Parker, 2009). Moreover, current trends in human resource management research suggest that strategic human resource (HR) and human capital management can be improved by considering the theoretical and practical implications of work design research (Delery & Shaw, 2001; Lepak & Snell, 1999). The structure, technology, and resources available in one's work environment are fundamental to the meaning and value one places in work (Torraco, 2005). As such, organisational and work design significantly shapes the contribution employees make to their organisations.

Work design is widely considered a major determinant of employee well-being and effectiveness (Holman & Wall, 2002). It has been associated with various stress outcomes such as psychological strain (Cooper, Dewe, & O'Driscoll, 2001). Several studies have suggested an association between work design and various aspects of mental health, such as depression, emotional exhaustion, psychological stress, and job satisfaction (e.g., De Jonge, et al., 2001; Janssen, De Jonge, & Bakker, 1999; Parker & Wall, 1998; Ylipaavalniemi, et al., 2005). This research

included three aspects of work design: (1) work context (i.e. job demands), (2) motivational characteristics (i.e. job control), and (3) social characteristics (i.e. social support). The level of demands placed on employees and the degree of autonomy or control afforded to employees are significantly related to strain (Karasek & Theorell, 1990). That is, stressful job demands produce high levels of strain, but greater job control can result in lower levels of strain. Job control also can buffer the negative effects of job demands on strain (Karasek, 1979). Social characteristics such as social support are likely to impact a variety of work outcomes (Humphrey, et al., 2007). Social characteristics are expected to reduce job stress by buffering workers against negative job events (Karasek & Theorell, 1990). They may also increase work motivation and prosocial work behaviours as they promote resilience, security, and positive moods on the job (Humphrey, et al., 2007).

In recent years, the nature of work has changed dramatically (Grant & Parker, 2009). Rapid developments in information, communication, and transportation and services (Barley & Kunda, 2001) have accelerated rates of change in work design and technology (Torraco, 2005). With the instant availability of information and reduced geographical distances, today's work processes differ from those routinely used just a decade ago (Grant & Parker, 2009). New work requirements have brought about major changes in how work is designed (Parker & Wall, 1998), such as new characteristics of work, new outcomes of work and new mechanisms that link them. The changing nature of work has renewed research interest in work design characteristics and their consequences for employees and organisations (Edwards, Scully, & Brtek, 2000). For the individual worker, an organisational focus on quality, service and productivity produces greater job demands that may be detrimental to health and personal outcomes. A customer focus leads to flatter organisations that may require a higher degree of flexibility and increased decision authority, increased learning opportunities, and greater skill discretion in some jobs for individual employees (Reilly, 1998). This can increase job demands, for example, requiring employees to make difficult, essential or rapid decisions, requiring them to pay constant attention, or requiring them to be more innovative and creative. In addition, high levels of job control are required to perform a task in organisations.

The development of technology has influenced work design and working life in organisations. The use of new technologies in organisations increases job demands such as workload, time pressure, and the need to analyse and solve problems in unexpected situations (European Foundation, 2000). For instance, workers in developed countries have experienced substantial changes in psychosocial work characteristics over the past generation. In Europe, surveys have shown increases in time pressure and workload demands between 1997 and 2000 (European Foundation, 2000). Similarly, in the United States a survey of workers reported increases between 1977 and 1997 in workers saying they were “working very fast” (from 55% to 68%) and having “never enough time to get everything done on my job” (from 40% to 60%) (Bond, Galinsky, & Swanberg, 1997). These aspects are often intertwined with situations where workers must depend on other staff resources beyond their control to finish a job. Consequently, workers need high levels of job control in order to accomplish their tasks. For example, in Europe the proportion of workers reporting a degree of autonomy over their pace of work increased from 64% in 1991 to 72% in 1996 (Walters, 1998). In the United States, the proportion of respondents saying they had “freedom to decide what I do on my job” increased from 56% in 1977 to 74% in 1997 and the proportion agreeing that “my job lets me use my skills and abilities” increased from 77% in 1977 to 92% in 1997 (Bond, et al., 1997).

In theory, job control should moderate the impact of job demands on employees’ well-being. Thus, the increases in job control reported in European and United States surveys might compensate for the increases in job demands such that employee well-being is unaffected. However, there may be a limit to the moderating effects of job control. For instance, in Europe, increases in autonomy have not been found to sufficiently compensate for increased work intensity (European Foundation, 2000). The proportion of high strain jobs in Europe increased from about 25% in 1991 to around 30% in 1996 (European Foundation, 2000). Yet while the European Foundation survey in 2000 showed a continuing increase in work intensity and job demands (i.e. working at very high speed and having deadlines that are perceived as too tight), it reported slight decreases in job control or autonomy between 1995 and 2000 (European Foundation, 2001). Low job control may create feelings of strain among employees, which can result in

greater job dissatisfaction, greater lack of commitment, higher turnover intentions, and lower job performance.

The present study focuses on work design among technical workers in a large telecommunication industry in Malaysia. Technical workers are defined as persons qualified in the practical application of one of the sciences who carry out practical work or give assistance with technical equipment (Oxford English Dictionary, 1989). They use tools and instruments, work with their hands, design objects, and repair equipment. Their work is relatively analytic and often requires specialised education, with most technical workers operating equipment, creating artefacts and possessing valued manual skills. Technical workers require basic skills and knowledge, formal education for training and socialisation, and on-the-job training (Barley, 1996).

The skills of technical people represent a crucial resource enabling a firm to meet its strategic objectives. Technical workers are needed to make flexible technologies actually flexible in practice (Schoenberger, 1988). This makes attracting technical talent a high priority item in corporate agendas and opens up an attractive market for qualified professionals. As a result, the effective management of technical employees is an important step in enhancing the competitive advantage of the company in the marketplace. Many organisations, however, experience high rates of attrition among valued technical workers, and therefore seek methods to halt this intellectual drain (Barnard, 1997). Both personal and work environmental characteristics contribute to the decision of an employee to leave his or her job. The increasing competition for high performance workers and the changing lifestyles of the workforce lead many companies to amend policies to better accommodate the demands of workers' personal lives. Yet, characteristics of the workplace environment itself frequently do not adequately provide for the needs of different employee groups (Barnard, 1997). When workplace factors that lead to dissatisfaction are coupled with promising external opportunities, it is not surprising that technical professionals leave employers to join competing firms or to found their own firms.

Work design could influence the expectations of technical workers and lead to personal outcomes such as psychological strain, job satisfaction, organisational

commitment, turnover intentions, and job performance. Therefore, the hypotheses of the present research focused on work design characteristics which cause strain and their consequences among technical workers in Malaysia. This research focuses on three aspects: work design, the experience of psychological strain, and the potential consequences of strain on work attitude variables (i.e. job satisfaction, organisational commitment, turnover intentions) and behavioural outcomes (i.e. job performance). This research also examined individual differences in self-efficacy as they might influence employees' perceptions of work design characteristics and their consequences on employee well-being (Podsakoff, LePine, & LePine, 2007).

Purpose of the Research

The present study utilizes an overall theoretical framework of work design – the Job Demands-Resources (JD-R) model to examine how different categories of working conditions among Malaysian technical workers are related to employee work reactions and job performance. The JD-R model categorized working condition into two general categories: job demands and job resources. The central tenet of the JD-R model is that job demands evoke an energy depletion process, whereas job resources (e.g. job control, social support, and self-efficacy) induce a motivational process.

Furthermore, Karasek's (1979) Job Demands-Control (JDC) model predicts that jobs with high demands and low control (i.e. high-strain jobs) will be harmful, leading to mental and physical health decrements. Karasek (1979) originally proposed that job control-latitude in decision making would serve as a buffering role by enabling employees to master their tasks and engage in problem-focused coping (Sonnentag & Zijlstra, 2006). His model has guided a large amount of research in recent years. However, this theory and the subsequent research have mostly come from North America and other Western cultures. It is important to examine whether these theories are adequate and appropriate for understanding these phenomena in different cultures. The current research is aimed at examining whether Karasek's (1979) model can be generalised to Malaysia, a country that is collectivistic with a very high power distance, and whether workers in Malaysia perceive strain in similar ways to their Western counterparts.

Research on the generalisability of the JDC model in cultures with a collective orientation has been extremely limited (for exceptions, see Xie, 1996; Yeung, 2008). It is important to test whether the model is unique to Westerners or applies to non-Western cultures. Today, the emergence of a competitive global business environment has challenged businesses to understand, communicate and motivate people from other cultures (Xie, 1996). For example, countries in South East Asia such as Malaysia have been hosts to many foreign companies (i.e. European and American). Given the globalisation of the economy and the increased number of multinational corporations, organisations that operate in different societies - as well as expatriates who move to work from one society to another - need to adapt to different patterns of work design characteristics. In addition, our complex global economy has dramatically increased the frequency with which managers from one culture are called on to lead work groups and teams from different cultures.

The present study is the first to test Karasek's JDC model among technical workers in Malaysia, a society that differs substantially from Western countries on many contextual variables, including its culture, society, politics and economic system (Ahmad & Aafaqi, 2004). Malaysia is one of the most culturally complex nations of the Asia Pacific (Udin & Ahmad, 2000). The major ethnic groups of Malaysia are Malays, Chinese, and Indians. Although Malaysian society is a multi-cultural mix of Malay, Chinese, Indian and other subcultures, there is general agreement that Malaysian workers share certain common and distinctive workplace values (Abdullah, 2005).

Malaysian culture is relatively high in collectivism, which reflects the subordination of personal goals to group goals, a sense of harmony and interdependence, and concern for others (Hofstede, 1991). Malaysian workers are group-oriented, respect elders and hierarchy, emphasise loyalty and consensus, and are concerned with harmonious relationships (Abdullah, 2005). People in collectivist cultures, such as Malaysia, tend to be more concerned with group harmony and pay more attention to interpersonal relationships than do those in individualistic cultures. Malaysia has also been found by several studies to have a high degree of power distance among the countries examined (Hofstede, 1980; Lim, 2001). Power distance is defined as "the extent to which the members of a

society accept that power in institutions and organisations is distributed unequally” (Hofstede, 1985, p. 348). Members of high power distance cultures are more likely to accept and be comfortable with structured authority relationships than are members of low power distance cultures (Schermerhorn & Bond, 1997). In high power distance countries like Malaysia, individuals tend to value hierarchy, and this means that they are more likely to show respect for superiors and expect them to take the lead (Abdullah, 2005). The combination of collectivism and high power distance is called ‘vertical collectivism’ (Singelis, Triandis, Bhawuk, & Gelfand, 1995). Singelis and colleagues described vertical collectivism as a culture within which one perceives the self as part of a group while accepting power or status inequalities within the group.

Additionally, Malaysians believe that they are subjugated to their environment and consequently feel that many events are controlled by “fate” or other factors outside their control (Abdullah, 2001). On the other hand, the JDC model emphasises the role that personal control plays in determining how individuals respond to the demands of their jobs. Thus, testing the JDC model in Malaysian society should provide valuable insights into the similarities and differences between people from collectivistic, high power distance cultures and the individualistic cultures most often studied.

In addition to examining the generalisability of Karasek’s (1979) model, the current study also examined the role of social support, following the Job Demands-Control-Support (JD-CS) model (Johnson, 1986; Karasek & Theorell, 1990). This model holds that employees’ experiences and abilities to carry out their work are heavily affected by their access to social support (Grant & Parker, 2009). In this study, I tried to clarify the nature of the relationships by examining the main effects as well as the buffering effects. First, the focus is on whether workers in jobs characterised by high demands and low control and low social support (called “iso-strain jobs”), experience more strain than workers in other jobs. I assessed this question by verifying whether the three work dimensions (i.e. job demands, job control, and social support) have main effects on psychological strain. Secondly, I examined the potential buffering effect of job control and social support on the relationship between job demands and psychological strain. Many past studies have used a combination of supervisor support and co-worker

support to measure social support in the JD-CS model. However, it can be argued that the impact of support depends on the source of support. For example, research by Baker, Israel and Schurman (1996) suggests that social support from the supervisor has more influence on employee job satisfaction and mental health than does support from co-workers. Thus, in the current study, I distinguished between three sources of social support: (1) perceived organisational support, (2) supervisor support, and (3) co-worker support.

Another addition to Karasek's model that I explore is how individual differences in self-efficacy influence the relationship between job demands and psychological strain. Self-efficacy might influence employees' perceptions of job demands (Podsakoff, et al., 2007). Indeed, Lazarus and Folkman (1984) have noted that individual differences affect the way individuals respond to stressful job demands by influencing the manner in which they appraise stressors such as job demands and the effects of job demands on strain. Although some researchers have suggested that personal self-efficacy reflects individualistic Western values and that the moderating effects of self-efficacy may be more evident in individualistic cultures (e.g., Schaubroeck, Lam, & Xie, 2000), it is important to extend research on self-efficacy to collectivist cultures, such as Malaysian society. Self-efficacy is important in the job stress process because it affects an individual's perception of control (Litt, 1988). People high in self-efficacy perceive more personal control and this might moderate the relationships between job demands and strain. Some Chinese studies have partially supported a moderating role for self-efficacy on the relationship between stressor and strain (Lu, Siu, & Cooper, 2005). Therefore, I attempted to replicate research investigating the moderating role of self-efficacy in the collectivistic, high power distance culture of Malaysian society.

Using both cross-sectional and longitudinal analyses, I tested the way in which the work design characteristics relate to psychological strain, job satisfaction, organisational commitment, turnover intentions, and job performance among technical workers in Malaysia. This research also aimed to determine the moderating effects of job control, social support and self-efficacy on the relationships between job demands and psychological strain. Finally, the study investigated two sets of mediating relationships: (1) the mediating effects of psychological strain in the relationships between work design (i.e. job demands

and job control) and the work attitude variables (i.e. job satisfaction, affective commitment, and turnover intentions) and (2) the mediating effects of job satisfaction, affective commitment and turnover intentions in the relationships between psychological strain and job performance. A mediator is a variable that provides the mechanism through which a predictor variable affects a criterion variable (Baron & Kenny, 1986). Mediators account for the relationship between variables by intervening between predictor and criterion variables. Identifying variables that transmit the effects of work design on work attitudes and the effects of work attitudes on job performance is important from a theoretical viewpoint because these mediators expand our understanding of the process by which strain reduces job performance. This is also important from a practical viewpoint because some of the potential mediators could be influenced by managerial policies such as job design practices.

Research Issues

The research in this thesis is related to the impact of work design on employee work reactions (psychological strain, job satisfaction, affective commitment, turnover intentions) and job performance among technical workers in Malaysia. The research sought to identify to what extent work design influences technical workers' well-being and job performance in Malaysia. Therefore, the eight research questions I address are:

1. What are the effects of work design (i.e. job demands and job control, social support, and self-efficacy) on psychological strain?
2. Do job control variables (i.e. timing control, methods control, skill discretion, and decision authority) moderate the relationship between job demands and psychological strain?
3. Does social support, such as perceived organisational support, supervisor support, and co-worker support moderate the relationship between job demands and psychological strain?
4. Does self-efficacy moderate the relationship between job demands and psychological strain?
5. Does psychological strain influence job satisfaction, affective commitment, turnover intentions, and job performance?

6. Do work attitudes (i.e. job satisfaction, affective commitment, and turnover intentions) influence job performance?
7. Does psychological strain mediate the relationship between work design and job satisfaction, affective commitment, and turnover intentions?
8. Do job satisfaction, affective commitment, and turnover intentions mediate the relationship between psychological strain and job performance?

Significance of the Research

This research contributes to current knowledge in several ways. First, the study of work design and its consequences among Malaysian technical workers extends theory to a new geographical region that is characterised as a collectivistic, high power distance country. A number of previous studies of the effect of work design on psychological health and moderators of work design have been carried out in European and American contexts (e.g., Jackson, Wall, Martin, & Davids, 1993; Janssen, et al., 1999; Karasek, 1979; Karasek & Theorell, 1990; Mikkelsen, Saksvik, Eriksen, & Ursin, 1999; Morrison, Cordery, Girardi, & Payne, 2005; van Veldhoven, Taris, de Jonge, & Broersen, 2005). These studies were conducted in Western societies, and their findings might not be transferable to Malaysian society which is based on collectivist and high power distance values (Ahmad & Aafaqi, 2004). My intensive literature review was unable to locate any studies of work design and well-being that have been carried out within the Malaysian context. Previous findings may reflect individualistic Western values. Since this research was carried out in Malaysia, it extends the existing body of knowledge related to the work design model to a different culture.

Second, this research tested a comprehensively formulated work design model (depicted in Fig. 3.1 in Chapter 3; see page 50) with a sample of technical workers. Technical workers have become increasingly important in organisations due to their role of providing technical support to such areas as maintenance and operations. In America, professional and technical occupations employ more people than any other occupational sector monitored by the Bureau of Labour Statistics (Barley & Kunda, 2001). For example, American firms employed one engineering technician for every two engineers, one science technician for every two scientists, and two health care technicians for every physician (Barley, 1996).

The Bureau of Labour Statistics (2009) estimated that technical occupations in the U.S. will increase to 9.3 percent by 2016. The proportion of Americans employed as technicians has grown by 240 percent since mid-century, a rate that dwarfs the expansion of all other occupational clusters charted by the Bureau of Labour Statistic (Barley, 1996). Similar occupational trends are occurring in other Western nations (Jonsson, 1998).

Technical workers in Malaysia have also become important due to the reformation of Malaysian industry. This reformation is tied to the evolution of the new competitive Malaysia which is being shaped by a supply and demand economy. The vision of the Malaysian government is that this rapidly developing nation will be fully industrialised by the year 2020. The accomplishment of this vision will require good facilities and infrastructures, including quality service systems in organisations. Technical workers are one of the vital human resources destined to achieve the government vision, as they support organisations to ensure their facilities and technologies are in excellent condition. Thus, the Malaysian government in the Ninth Malaysia Plan stated that the number of technical workers is expected to grow at an average rate of 2.5 percent per year from 2006 to 2010 (The Star, 2006). In the Ninth Malaysia Plan, the government allocated a high budget to technical training and education (The Star, 2006). Due to the importance of technical staff in organisations and their role in national competitiveness, the study of work design is important for identifying working conditions which meet the expectations of these workers.

The third contribution of this research is the use of a longitudinal research design which permitted consideration of baseline levels of the feeling of strain and personal outcomes. According to Parker, Wall, and Cordery (2001), work design research has been dominated by cross-sectional studies that focus on naturally occurring variations in job conditions. Hence, associations that are found between work design and outcomes need to be interpreted with caution. A longitudinal design can better determine the direction and extent of change for individual respondents (Shaughnessy, Zechmeister, & Zechmeister, 2006), which can explain patterns of the impact of job design on employees' well-being and personal outcomes and provide an opportunity to validate theoretically hypothesised causal relationships between variables. A longitudinal study also

helps by investigating the effects of important covariates such as age and work experiences. Despite the frequent suggestion to use longitudinal designs, this method is rarely adopted in research.

Another contribution of the present research is the use of a broader conception of job performance variables (i.e. contextual performance and in-role performance). This study paid attention to the recommendation of Parker and colleagues to incorporate the influence of work design on contextual performance (Parker & Wall, 1998; Parker, et al., 2001). Previous literature on the effects of work design has only focused on task performance issues, such as production quantity and sales value, rather than on contextual performance (e.g. citizenship behaviours) (Parker, et al., 2001). The present study measured two types of performance (i.e. in-role performance and citizenship behaviours). In-role performance is codified in position descriptions and role requirements, while citizenship behaviours are discretionary in nature and are usually not recognised by the formal reward system of the organisation (Ackfelt & Coote, 2005). This study contributes in two ways to our understanding of the effects of work design on a broad range of performance. First, I investigated the effects of work design variables on job performance via psychological strain. Past research has demonstrated that work design affects psychological strain and many studies have pointed out that work design is an important predictor of job performance. Second, I examined the effects of psychological strain on job performance with job satisfaction, affective commitment, and turnover intentions as mediators.

A fifth contribution of this research is the inclusion of a dispositional variable, self-efficacy, which represents an individual's beliefs regarding the likelihood that a particular course of action or behaviour can be carried out (Bandura, 1997). Levels of self-efficacy may influence individuals' preferences for different types of jobs and work environments. Self-efficacy is a universally important component of individual and group functioning (Bandura, 1997). Previous researchers have suggested that personal self-efficacy reflects individualistic, Western values and that the moderating effects of self-efficacy may be more evident in individualistic cultures (e.g., Schaubroeck, et al., 2000). However, it is important to test the moderating effect of self-efficacy in more collectivist cultures, such as Malaysian society. Thus, this research contributes to the current

knowledge by including the levels of self-efficacy in the work design model among technical workers in Malaysia.

A sixth contribution of this research is the development of a more precise understanding of job demands (i.e. quantitative demands, attention demands, problem-solving demands, and responsibility demands), job control (i.e. skill discretion, decision authority, time control, and methods control), and their consequences for psychological well-being and personal outcomes among technical workers. The better understanding represented by this model will assist organisations in determining which job characteristics are most important for their employees. This should help human resource managers to formulate strategies for redesigning jobs in their organisations and could enhance psychological well-being as well as organisational commitment and performance among employees.

A final contribution of the current research is the inclusion of social characteristics (i.e. social support) in the work design research. Social characteristics have received much less attention than other variables in the work design literature (Humphrey, et al., 2007). Although social information processing theory deals with the effect of social context on perceptions of motivational work characteristics, it does not discuss social characteristics as substantive work characteristics (Humphrey, et al., 2007). Recently, researchers have noted that social characteristics are important components of work (Grant & Parker, 2009; Humphrey, et al., 2007). Researchers agree that employees' experiences and abilities to carry out their work are affected by their access to social support (Grant & Parker, 2009). Previous studies noted that relationships between workers are among the most important determinants of well-being (Myers, 1999) and perceptions of meaningful work (Gersick, Dutton, & Bartunek, 2000). Thus, my research contributes to the current knowledge by including the social context in the work design model among technical workers in Malaysia.

Structure of the Thesis

This thesis is organised into ten chapters. Each chapter begins with a chapter overview, in order to help readers understand the flow of ideas presented. A brief outline of each chapter follows:

Chapter 1: Introduction to the thesis presents the background and problem statement of the research of work design and the way this relates to individual, organisations, and the society as a whole. Specifically, this chapter has described the background and problem statement of the thesis, the purpose of the research, research issues, and the significance of the research.

Chapter 2: Literature review provides an overview of the conceptual framework that guided the research. This chapter also provides a review of the previous literature on the variables incorporated in this study. It discusses the conceptualisation of work design, the impact of work design, the conceptualisation of strain and the outcomes of psychological strain, based on the findings of previous studies.

Chapter 3: Theoretical framework and hypotheses development develops a theoretical model for the prediction of psychological strain and the criterion variables (i.e. job satisfaction, affective commitment, turnover intentions, and job performance). Drawing on established theoretical frameworks, I derive propositions that address how individual differences in self-efficacy and social support connect to Karasek's model among technical workers in Malaysia. This chapter describes all the variables involved in this study and the association between these variables. The hypotheses of the study are also discussed.

Chapter 4: Research methodology describes the research design, organisational context, sample and population, instrument development, and how the data were analysed.

Chapter 5: Psychometric analysis of the research instrument presents the results of confirmatory factor analysis and reliability analyses of the research instruments. This chapter describes how missing values and outliers were handled, and presents the results of confirmatory factor analysis of each scale and the results of reliability and normality analyses.

Chapter 6: Cross-sectional analysis of main and moderating effects presents the results of the cross-sectional analysis at both Times 1 and 2. This chapter describes the relationships between work design and psychological strain, the relationships between psychological strain and job satisfaction, affective

commitment and turnover intentions, and job performance, and the relationships between job satisfaction, affective commitment, and turnover intentions and job performance. The moderating effects of job control, social support and self-efficacy are also outlined in this chapter.

Chapter 7: Longitudinal analysis of main and moderating effects presents the results of longitudinal analyses on the main and moderating effects, to address the causal hypotheses adopted in this study.

Chapter 8: Cross-sectional analysis of mediation effects presents the results of the mediation analysis based on the cross-sectional analysis at Time 1 and Time 2. In this chapter, I describe the mediating effects of strain in the relationships between work design and the outcome variables. I also describe the mediating effects of job satisfaction, affective commitment, and turnover intentions.

Chapter 9: Longitudinal analysis of mediation effects presents the longitudinal mediating effects of strain and the mediating effects of job satisfaction, affective commitment, and turnover intentions.

Chapter 10: General Discussion discusses the importance and contributions of this research and its findings, and the implications it has for existing research and practice. It also mentions certain limitations of the study, and makes recommendations for future research in this field.

CHAPTER 2

LITERATURE REVIEW

Chapter Overview

This chapter discusses the literature on work design variables and their consequences. Firstly, I review the major work design theories that have been investigated in the literature. This provides a background on the history and theoretical underpinning of work design research. Secondly, I explain the conceptualisation of work design in this study followed by an explanation of conceptualisation of psychological strain as a consequence of work design. Next, I discuss the moderating mechanisms assumed to underlie work design effects on psychological strain, and finally, I describe the outcome variables of psychological strain investigated in the present study.

Theoretical Foundation of Work Design

Work design constitutes a set of work characteristics that contribute to employees' behaviour. According to van Veldhoven, Taris, de Jonge, and Broersen (2005), the relationship between work design and employee health and well-being has attracted considerable attention in the job stress literature. Over the past 25 years, several conceptual models have been developed that concentrate on the influence of work design on health and well-being of employees.

After reviewing the literature, I found several competing models that have been widely used by researchers to predict the impact of work design on psychological well-being and organisational outcomes. The most prominent models are Job Characteristic Model (JCM) (Hackman & Oldham, 1980), Job Demands-Control model (JDC) (Karasek & Theorell, 1990), Job Demands-Control-Support model (JDCS) (Johnson, 1989), and Job Demand Resource model (JDR) (Bakker et al., 2003).

Job Characteristic Model

The Job Characteristics Model (JCM) has been widely used in work design research. This model was initially formulated as a model of job redesign by

Hackman and Lawler (1971), who are considered to be the fathers of job characteristics theory (Boonzaier, Ficker, & Rust, 2001). In 1974 and 1980, Hackman and Oldham developed and then revised the job characteristics theory and termed their refinement the Job Characteristic Model (JCM), which is shown in Figure 2.1. The model is considered to be the most influential in guiding research on the nature or characteristics of jobs (Boonzaier, et al., 2001; Johns, Xie, & Fang, 1992).

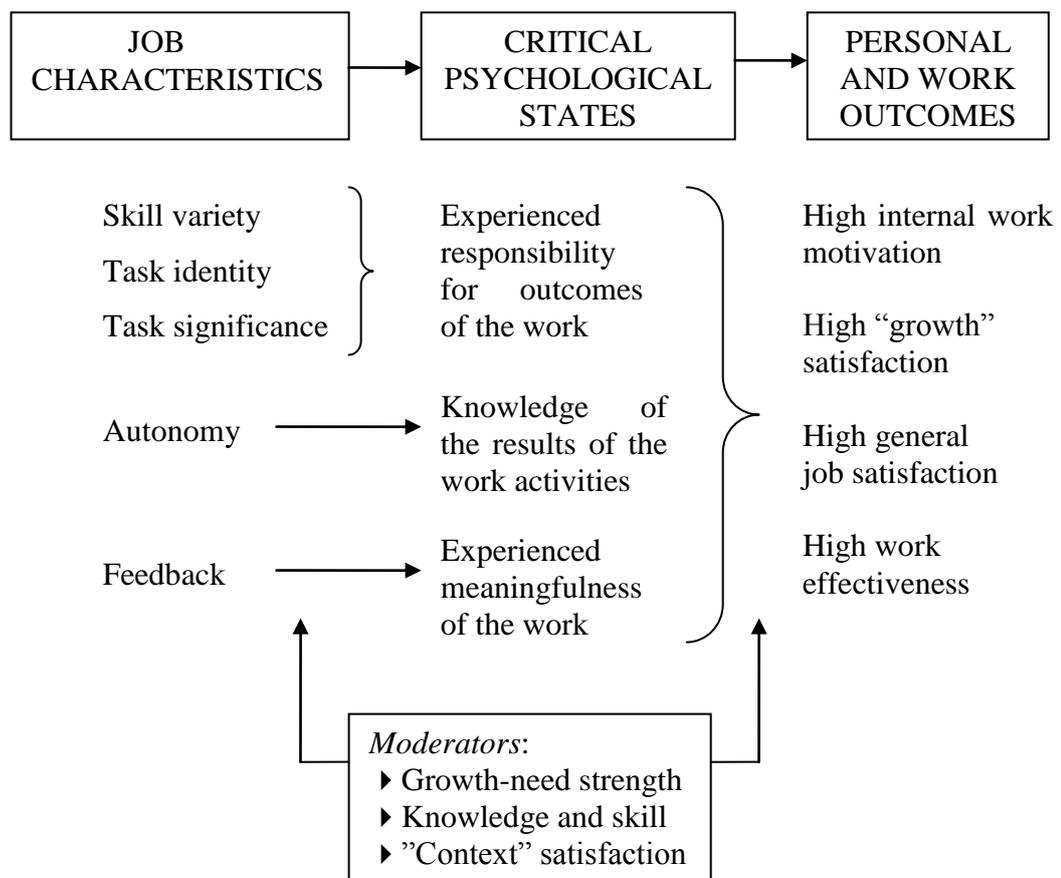


Figure 2.1. Hackman & Oldham's (1980) Job Characteristics Model

The JCM by Hackman and Oldham (1980) incorporates five core job dimensions that contribute to certain critical psychological states which in turn, lead to a number of beneficial personal and work outcomes. The links between the job dimensions and psychological states, and between the psychological states and the outcomes, are moderated by three individual difference variables namely knowledge and skill, growth need strength, and "context" satisfaction. The core job characteristics are summarised below:

- i. *Skill variety*. This refers to the extent to which the job requires the use of various skills and talents of the employee.
- ii. *Task identity*. This refers to the degree to which the job involves completing a whole, identifiable piece of work rather than simply a part. That is, doing a job from beginning to end with a visible outcome.
- iii. *Task significance*. This involves the importance of the task. It involves both internal significance (e.g. how important the task is to the organisation) and external significance (e.g. how proud employees are to tell their relatives, friends, and neighbours what they do and where they work).
- iv. *Autonomy*. This refers to whether the job provides substantial freedom, independence and discretion to the employee in carrying out the work; how much freedom and control employees have to perform their job, for example, schedule their work, make decisions or determine the means to accomplish the objectives.
- v. *Feedback*. This refers to objective information about progress and performance that can come from the job itself, from supervisors or from other sources.

The JCM also posits that all three of the critical psychological states must be experienced by an individual if desirable outcomes are to emerge. Firstly, the person must experience the work as meaningful. That is, the individual must feel that the work he or she does is generally worthwhile, valuable, or important by some system of values he or she accepts. Secondly, the person must have knowledge of the results of his or her work. That is, the individual must know and understand how effectively he or she is performing the job. Finally, the individual must experience personal responsibility for work outcomes. The individual must feel personally accountable for the results of the work he or she does. If any one of these three states is not present, motivation and satisfaction will be attenuated. The critical psychological states can be summarised as follows:

- i. *Meaningfulness*. This cognitive state involves the degree to which employees perceive their work as making a valued contribution, as being important and worthwhile.
- ii. *Responsibility*. The degree to which the employee feels personally accountable for the results of the work they do.

- iii. *Knowledge of results.* The degree to which the employee knows and understands how effectively they perform their job.

As shown in Figure 2.1, skill variety, task identity and task significance lead to the psychological state of the meaningfulness; task autonomy leads to the psychological state of experienced responsibility; and task feedback leads to the psychological state of knowledge of the actual results of work activities. Also shown in Figure 2.1 are several outcome variables that are predicted to result when the psychological states are present. First is internal motivation. Internal motivation exists when good performance is an occasion for self-reward and poor performance prompts unhappy feelings. Other predicted outcomes include growth satisfaction (a feeling that one is learning and growing personally or professionally at work), general job satisfaction and work effectiveness. The theory predicts that when employees find their work meaningful, experience personal responsibility for work outcomes, and have regular, trustworthy data about how they are doing, then they will both perform well and feel good about it.

The JCM explicitly recognises that not all employees will respond positively to a job high in motivating potential. The JCM identifies three characteristics of people as especially important in determining a “fit” between a job’s motivating potential and the employee. These characteristics are known as moderators. The first moderator reveals employees must have sufficient knowledge and skill to perform the work effectively (Hackman & Oldham, 1980). For jobs high in motivating potential, employees with sufficient knowledge and skill to perform well will experience positive feelings as a result of their work activities. The reason is that a motivating job “counts” for people, and doing it well can be an occasion for significant self-reward. However, when individuals with inadequate knowledge and skill work on highly motivating jobs they are likely to experience a good deal of frustration and unhappiness at work, and, because the job is important, such individuals may opt to withdraw from the job – either behaviourally, by changing jobs, or psychologically, by convincing themselves that in fact they do not care about the work. When a job is low in motivating potential, it does not offer an opportunity for the three psychological states to be experienced at work. Consequently, employees are likely to experience low internal work motivation regardless of their level of knowledge and skill.

The second moderator proposed by the JCM is growth-need strength (GNS). The notion of GNS is based on the Maslow's need hierarchical theory of motivation (Maslow, 1943). According to Maslow (1943), human behaviour is motivated by a set of basic needs. The JCM refers to the higher-order needs of the worker as GNS. Specifically, GNS refers to workers' needs for personal accomplishment, learning, and developing themselves beyond where they are at present (Boonzaier, et al., 2001). Boonzaier and colleagues (2001, p.21) argued that "GNS is viewed as one of the moderators because it is depicted as influencing the relationships between job characteristics and psychological states as well as the relationships between the psychological states and personal and work outcomes". GNS represents the need for personal growth and development within the work environment (Boonzaier, et al., 2001). People with high growth needs are more likely (or better able) to respond to optimum core job dimensions than those with low growth needs. Those people with strong needs for personal growth and self-direction at work are most likely to appreciate and respond enthusiastically to the opportunities for personal accomplishment provided by a job high in motivating potential. Individuals who have relatively low growth need strength may be less eager to exploit those opportunities. These individuals may not recognise the opportunities for growth provided by the job, or they may experience a complex, challenging job as threatening. In contrast, when the job has low motivation potential, even employees with high growth needs will experience low internal work motivation on jobs that are low in motivation potential, since such jobs do not provide opportunities for the three critical psychological states. Although a match between a job low in motivating potential and an employee with low growth needs avoids the possibility of "overstretching" the employee, this type of fit is not predicted to result in the positive outcomes specified by the JCM.

Finally, the JCM predicts that employees' reactions to jobs with high motivating potential are also affected by their satisfaction with aspects of the work context (e.g., pay, job security, co-workers and managers) (Oldham, Hackman, & Pearce, 1976). When employees are not satisfied with one or more of these contextual factors, their ability to respond positively to a job high in motivating potential may be severely diminished. The reason is that active dissatisfaction with such contextual factors distracts employees' attention from the work itself and orients

their energy instead toward coping with the experienced problems. Only when such problems are resolved and people become relatively satisfied with the work context are they able to experience, appreciate, and respond to the inherent richness of well-designed jobs.

Overall, the JCM provides a meaningful framework for exploring the relationship between specific job dimensions pertaining to psychological strain, job satisfaction and intrinsic motivation. The main value of the JCM is that it links the nature of the job, individual differences, psychological factors and outcomes together, rather than treating each in isolation from the other. The JCM specifies the conditions under which individuals become internally motivated to do their job effectively. All the five core job dimensions are seen as prompting three critical psychological states that must be present for internally motivated work outcomes (internal work motivation, quality of work performance, job satisfaction, absenteeism and turnover). The model suggests that favourable work design provides more meaningful and challenging work, more autonomy and better feedback. However, jobs which do not contain these characteristics need to be redesigned.

Job Demand-Control Model

Another widely used theory in work design research to predict employee well-being and outcomes is the Job Demands-Control (JDC) model of strain (Karasek, 1979b). The JDC model is based on the premise that health and behavioural consequences of work design can be predicted by the interaction of two key work dimensions: decision latitude (i.e. a combination of the amount of decision authority and skill discretion) and psychological demands (i.e. the workload or intellectual requirements of the job).

The theoretical argument underlying this model is that physiological strain results from the interactive effect of one's job demands and the amount of job control available in one's job. More specifically, the theory posits that in order to minimise physiological strain, job demands should be matched to job control, such that when job demands are high, job control should correspondingly be high. High job control allows employees to adapt to demands by developing appropriate behavioural response patterns. Although Karasek's original work focused on

physiological strain, his model has been extended to mental or psychological strain or general well-being (e.g., Chambel & Curren, 2005; De Croon, Sluiter, & Blonk, 2004; Xie, 1996).

The JDC model has played a major role in the integration of work design concepts with Person-Environment Fit models (Chambel & Curren, 2005). The JDC model posits that there are two elements of work (job demands and job control) that impact on an individual's level of well-being and the quality of his or her working life. It presupposes that psychological strain results not from a single aspect of the work environment, but from a joint effect of the levels of job demands and the degree of job control that employees are able to exercise over their work. In particular, these two dimensions of work environment interact with each other to create job strain (Karasek, 1979). Job demands reflect the amount of work required from the employee, and the extent to which he or she has to work under time pressure, whereas work control refers to the extent to which the employee can exert influence over the task during a normal working day (Karasek, 1979; Karasek & Theorell, 1990). Figure 2.2 shows how various consequences are predicted by the interactions between job demands and job control.

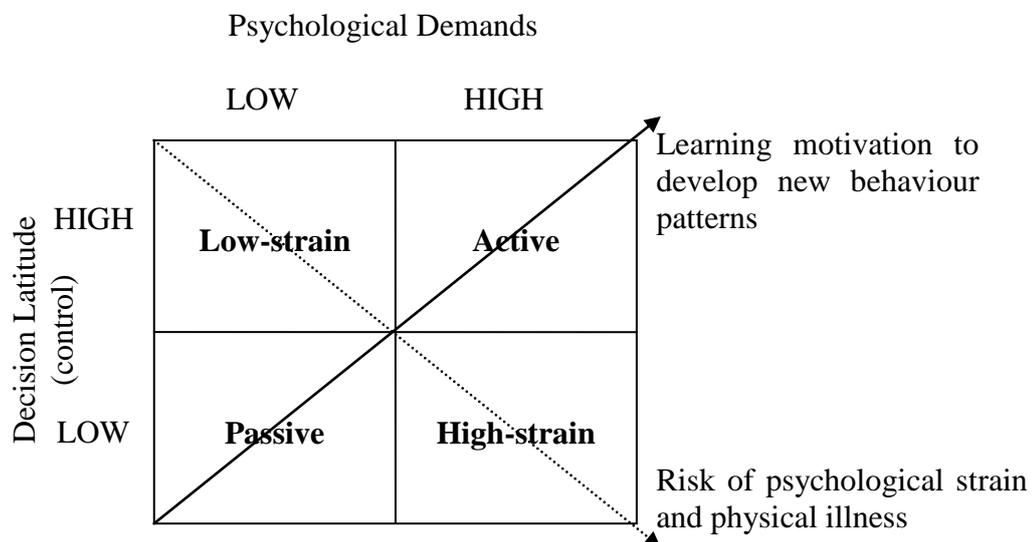


Figure 2.2. Karasek's (1979) Job Demand-Control Model

Job strain is hypothesised to exist when there are high levels of job demands and low levels of control. However, when high levels of job demands and job control exist the job is described as being *active*, meaning that the demands act as a

source of challenge, rather than as a source of mental and physical stress. The JDC model suggests that high levels of job control protect the employee from the harmful effects of a demanding job. In contrast, work conditions that are low in job demands and job control are considered to be *passive*, where, over time, employees are unable to make decisions and solve difficulties. These situations can also be stressful. The last quadrant in the JDC model proposes that people with high levels of control and minimal work demands will experience *low strain*.

The JDC model has been an important anchoring point for research on the situational impact of work on employees' health and well-being. Many researchers in the management and psychology literature have tested Karasek's theory. There has been wide variation, however, in the specific outcome variables measured. Van der Doef and Maes (1999) reviewed 63 empirical studies published from 1979-1997 that employed Karasek's model. They identified two broad categories of outcome variables studied: (1) *job-related* well-being, such as job satisfaction (Chay, 1993), job-related psychological well-being (Mullarkey, Jackson, Wall, Willson, & Grey-Taylor, 1997) and burnout (Landsbergis, 1988; Melamed, Kushnir, & Meir, 1991), and (2) *general* psychological well-being, such as psychological distress (Barnett & Brennan, 1997), depression (Baker, et al., 1996; Carayon, 1993), and anxiety (Fletcher & Jones, 1993; Kushnir & Melamed, 1991). They found that most of the previous studies supported the JDC model, where working high demands-low control appears to be associated with lower general psychological well-being, low job satisfaction, more burnout, and more job-related psychological distress.

De Lange, Taris, Kompier, Houtman, and Bongers (2003) tested the JDC model and its extensions and found moderate support for the strain hypothesis. De Lange and colleagues (2003) proposed that evidence of the strain hypothesis effects job demands and job control but that these effects could be additive or interactive. Previous research appears to support the additive rather than the interactive relationship (Turner, Chmiel, & Walls, 2005). This suggests that the interactions proposed by Karasek (1979) are perhaps not the best way of conceptualising the joint effect of these work characteristics on employee health and well-being (van Veldhoven, et al., 2005). Van der Doef and Maes (1999) in their meta-analysis noted that Karasek's (1979) initial study allowed for only a moderating effect of

control, whereas in a subsequent study, Karasek (1989) also specified a direct effect for control on the criterion variables. The moderating effect of control is labelled “the buffer hypothesis”, while “the strain hypothesis” refers to the alternate model which specifies a direct effect of control (Shen & Gallivan, 2004).

To conclude, the JDC model implies that strain is caused by a combination of the level of psychological job demands and the amount of decision latitude (control). There has been much research investigating the demand-control model, and both dimensions have been shown to affect strain (Parker & Wall, 1998).

Job Demand-Control-Support Model

Other research has extended the JDC model to include social support as a second moderator (Johnson, 1989; Johnson & Hall, 1988; Karasek & Theorell, 1990; Payne, 1979). This has become known as the Job Demands-Control-Support (JDSCS) model. This model focuses on three work characteristics: job demands, job control and social support. In the JDSCS model, job demands are considered to be primarily psychological, relate to phenomena such as high work pace, time pressures and work difficulty. Following the JDC model, control over decisions concerning the job is thought to interact with demands to buffer job demands adverse impact (Karasek & Theorell, 1990). Support, defined as helpful interaction with supervisors and co-workers, is also thought to buffer the impact of job demands (Karasek & Theorell, 1990).

This model is based on two central assumptions. The first is that psychological strains (such as emotional exhaustion and mental fatigue) occur particularly in jobs characterised by high demands in combination with both low job control and low social support. This is labelled the “iso-strain hypothesis”. The second assumption is that work motivation as well as learning and development opportunities will occur in jobs characterised by high demands, high job control and high social support. The JDSCS model predicts that employee strain should be highest when high work stress is combined with low levels of both work control and social support (Johnson, 1986). This model is in line with the stress-buffering model of social support, which proposes that social support protects the individual

against the adverse effects of stress by helping the person to redefine the problem and providing a solution to it (Cohen & Wills, 1985).

There are many studies which found that the components of the JDCS model were related to a range of indicators of well-being (Daniels, Beesley, Cheyne, & Wimalasiri, 2008). Daniels and colleagues (2008) argued that much of the debate concerning the JDCS model has revolved around the hypotheses that interaction between demands, control, and support explain variance beyond their main effects. Most studies that have been concerned with well-being provided little support for the buffering effects of control and support on demands (De Lange, et al., 2003). As with the JDC model, there is also an additive and an interactive form of the JDCS model. The additive form of the JDCS model predicts that high demands and low control and low social support each cause psychological strain and that their combined (additive) impact will be stronger than their individual (separate) effects. The interactive form of the JDCS model predicts that control and social support moderate the negative impact of high demands on well-being (i.e. they interact with demands to reduce its negative impact). According to Totterdell, Wood, and Wall (2006), both forms predict that psychological strain will be greatest under the combination of high demands with low control and low social support (in JDCS model). The literature with respect to the relationship between the JDCS model and psychological well-being generally supports the 'iso-strain' hypothesis, but support for the moderating effect of social support on the 'job strain-psychological well-being' relationship is less consistent (e.g., Pelfrene, et al., 2002; van der Doef & Maes, 1999).

One problem with many tests of the hypothesised interaction is that they do not necessarily match the foundation explanation in the JDCS model of the beneficial effects of control and support (Daniels, et al., 2008; Van Vegchel, De Jonge, & Landsbergis, 2005). De Lange and colleagues (2003) argued that generalised assessments of perception of control, support and demands characterise most research on the JDCS model. Such measures rarely reflect individuals' agency in shaping their jobs (Daniels, 2006). Individuals' agency is prominent in the explanation of how control and support operate (Karasek & Theorell, 1990). Karasek and Theorell (1990) argued that both control and support, rather than being necessarily beneficial in their own right, enable more effective coping with

work demands. They argued that control enables individuals to engage in active problem-solving to deal with work demands, which in turn fosters better well-being and performance (Daniels, et al., 2008; Parker, Turner, & Griffin, 2003). Karasek and Theorell (1990) argued that social support can facilitate problem-solving, and is also a source of emotional support. There is some evidence for the idea that job control and social support facilitate active problem-focused coping. For instance, Ito and Brotheridge (2003) found that co-worker support and job autonomy were linked with a dimension of active coping labelled positive orientation. Co-worker support was related to seeking advice, assistance, and working harder as means of coping. Daniels (1999) also found that control and support interacted with problem-focused coping and demands, so that control and support can bolster the effects of problem-focused coping on well-being.

Karasek (1989, p. 143) commented that focusing on statistical interactions “is not the main issue” and that the practical implications of the main effects model, where low control, low support, and high demands are associated with poor well-being, are the same as the buffering model. Karasek and Theorell (1990) considered that control, in particular, and support, both promote well-being and productivity through fostering active problem-solving as a means of coping with job demands.

In summary, the JDCS model aims to improve employee health and well-being not only by reducing work stress, but also by creating the right conditions under which motivation and personal growth in work can be achieved.

Job Demand-Resources Model

The Job Demand-Resources (JD-R) model is a more recent theoretical model that encompasses the JDC and JDCS models (Bakker & Demerouti, 2007). The JD-R model proposes that employee well-being is related to a wide range of workplace variables. There are two general categories of job characteristics based on this theory: job demands and job resources (Bakker, Demerouti, Taris, et al., 2003). Job demands refer to “those physical, psychological, social, or organisational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and psychological costs” (Bakker & Demerouti, 2007, p. 312).

Examples are high work pressure, an unfavourable physical environment, and emotionally demanding interactions with clients. Although job demands are not always negative, they can lead to psychological strain in the absence of adequate resources (Bakker & Demerouti, 2007; Winefield, Boyd, Saebel, & Pignata, 2008). Job resources refer to “those physical, psychological, social, or organisational aspects of the job that are functional in achieving work goals, reduce job demands and the associated physiological and psychological cost, and stimulate personal growth, learning, and development” (Bakker & Demerouti, 2007, p. 312). Job resources are not only important to deal with high job demands, but they also are important in their own right (Bakker & Demerouti, 2007).

Kahn (1990) recognised that job resources are characteristics of work situations that shape the degree to which people employ and express themselves physically, cognitively, and emotionally during role performance. Hackman and Oldham’s (1980) job characteristics theory also refer to job resources as job characteristics with motivational potential, including autonomy, feedback, and task significance. These job characteristics foster critical psychological states (e.g., meaningfulness), which in turn drive people’s attitudes and behaviours. Examples of job resources are time control, performance feedback, a supportive leader, and trusting relationships with colleagues. The JD-R model also agrees with the conservation of resources theory (Hobfoll, 2001) which argues that human motivation is directed towards the maintenance and accumulation of resources (Bakker & Demerouti, 2007). Lack of job resources is a key issue in the stress process (Winefield, et al., 2008).

The main premise of the JD-R model is that job demands and job resources initiate two relatively independent processes that explain well-being at work (Bakker & Demerouti, 2007). The JD-R model proposes that job characteristics illustrate two different processes (see Figure 2.3, p.28) which are involved in the development of strain and motivation. The first *health impairment process* is the negative effects of high job demands (i.e. work overload) and inadequate resources on the employees’ psychological and physical well-being (Bakker, Demerouti, de Boer, & Schaufeli, 2003; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). High job demands overstretch psychological and physical resources and may lead to negative job strain and, in turn, to health problems and

negative organisational outcomes (Demerouti, et al., 2001; Lewig, Xanthopoulou, Bakker, Dollard, & Metzger, 2007).

The second process is the *motivational process*. The availability of job resources increases feelings of belonging to the organisation (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). These feelings lead to “high work engagement (i.e., a fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption), and consequently, to positive organisational outcomes (e.g., low turnover intentions)” (Lewig, et al., 2007, p. 432). On the other hand, low job resources inhibit the ability to deal effectively with high job demands and lead to reduced motivation or commitment that result in mental withdrawal or disengagement (Demerouti, et al., 2001). Job resources “may play either an intrinsic motivational role because they foster employees’ growth, learning and development, or they may play an extrinsic motivational role because they are instrumental in achieving work goals” (Bakker & Demerouti, 2007, p.313).

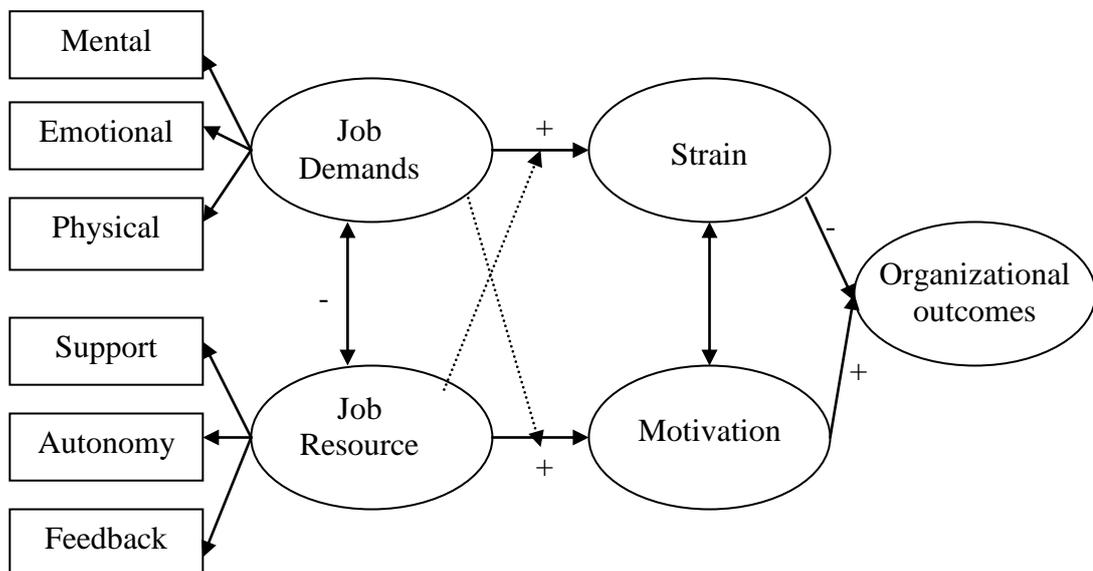


Figure 2.3. The Job Demands-Resources Model

Source: Bakker and Demerouti (2007)

In addition to the main effects of job demands and resources, the JD-R model proposes that the interaction between job demands and job resources is important for the development of job strain and motivation as well (Bakker & Demerouti,

2007). More specifically, the model proposed that job resources may buffer the impact of job demands on job strain, including burnout (Bakker, Demerouti, Taris, et al., 2003). This assumption is consistent with the job demand-control model (Karasek, 1979), but expands this model by claiming that several different job resources can play the role of buffer for several different job demands (Bakker & Demerouti, 2007). Thus, whereas the JDC model states that control over the execution of tasks (autonomy) may buffer the impact of work overload on job stress, the JD-R model expands this view and states that “different types of job demands and job resources may interact in predicting job strain” (Bakker & Demerouti, 2007, p. 314).

To summarise, the JD-R model proposes that job demands are the main initiators of the health impairment process that leads to negative organisational outcomes, while job resources are the most crucial predictors of engagement and consequently, of positive outcomes.

Summary

All the above models explain the work characteristics that influence an employee’s well-being and outcomes through cognitive appraisal, elements in the work environment, and response to the work environment. There are three connections between the theories. Firstly, all explanations of job characteristics seem to focus on individual perceptions of their work characteristics. Secondly, all models state the elements in the environment that are appraised by the individual as obstacles or challenges that could cause the loss of something of value to them. Finally, these models note that the individual responds to the elements in their work environment. Individuals respond based on whether they perceive the work elements as favourable or unfavourable work conditions.

Since the aim of the present study was mainly to investigate the impact of work design on psychological strain, which in turn affects job satisfaction, affective commitment, turnover intentions, and job performance, the present study adopted the JDC, JDCS and JD-R models to provide the theoretical background of the study. The JDC model provides the understanding of psychosocial work conditions, namely job demands and job control. At the same time, the JDCS model has extended the model to include the role of social support in the

relationship between work design and psychological well-being. The JD-R model has expanded the earlier models by classifying work design into two general categories: job demands and job resources, thus constituting an overarching model that may be applied to various occupational settings, irrespective of the particular demands and resources involved. The JDC and JDCS models have been restricted to a given and limited set of predictor variables that may not be relevant for all job positions. The combination of the models will enable a comprehensive examination of work design and linkages between the variables in this study. My research therefore, while it incorporates the JDC and JDCS models, is built upon the JD-R model more specifically.

Conceptualisation of Strain

Beehr (1995) defined strain as states that are harmful and usually have an adverse affect on the individuals experiencing them. Lee and Ashforth (1996) also defined strain as affective, feeling states of the individual characterised by depleted emotional resources and lack of energy. Much research has examined feelings of strain arising from certain job features (usually referred to as ‘stressors’) (Warr, 2002). According to Lazarus and Folkman (1984), strain arises when individuals perceive themselves as unable to meet environmental demands. If strain occurs, people will try to deal with either the stressor itself or with the negative effects of this stressor (coping) (Lazarus & Folkman, 1984). French, Caplan, and Harrison (1982) suggested that strain can result from the mismatch between the person and the environment on dimensions important to the well-being of the individual. They described the relationship between the person-environment (P-E) misfit and strain as a U-shaped curve. For each individual’s capabilities there are optimal levels of environment demands. When these optimal levels are reached, strain will be minimal; with too little or too many demands, strain increases. In the present language, strains are the outcomes of stress in the workplace and they are usually states associated with ill health (Beehr, 1995). Indices of strain assessed in previous research fall into three categories: affective/psychological, physical or physiological, and behavioural.

Psychological (affective) job strain is defined as aversive and potentially harmful psychological reactions of the individual to stressful work (De Croon, et al.,

2004). Psychological strain refers to a particular form of emotional distress arising in response to a situation involving perceived threat to a person's well-being. Psychological strain is often measured in terms of generalised distress (either job-specific or context-free), a combination of the two negative forms of well-being identified as anxiety and depression (Warr, 2002). Jex and Beehr (1991) noted that the relationships between the types of work stressors and psychological strain are stronger than the relationships between these stressors and other types of strains. Individual outcomes such as anxiety and depression are often related to occupational stressors (Beehr, 1995).

Many studies of workplace stress have utilised self-reports to gauge the extent of psychological strain experienced. A self-report measure of psychological strain which has been frequently utilised is the General Health Questionnaire (GHQ), developed by Goldberg (1978) to detect minor psychological disturbance in non-clinical populations. The GHQ focuses on issues such as:

- Ability to concentrate on tasks
- Losing sleep because of worries
- Feeling constantly under strain
- Feeling unhappy and depressed.

Banks, Clegg, Jackson, Kemp, Stafford, and Wall (1980) recommended a twelve-item version of the GHQ for assessing strain in employment settings. This instrument (GHQ-12) has been utilised in numerous studies.

Strain may also be manifested in terms of physiological or psychosomatic symptoms. A minority of studies have examined psychosomatic symptoms of strain in terms of reported sleeplessness, headaches and similar problems, and physiological variables such as heart rate, blood pressure and catecholamine levels (Warr, 2002). Landsbergis, Schnall, Belkic, Baker, Schwartz, & Pickering (2001) argued that physiological strain is also associated with hypertension and cardiovascular disease (CVD). Beehr (1995) noted that complaints about aches and pains, sleeping difficulties, and general discomfort have been used as somatic strain, but it is difficult to conclude that these measures are clear indicators of actual physiological problems. Studies exploring physiological components of strain have typically focused on one or more of the following indicators: cardiovascular symptoms (especially increased heart rate and blood pressure),

biochemical reactions (such as blood cholesterol), and gastrointestinal symptoms (e.g., peptic ulcers). Fox et al. (1993) submitted that stressors arising from excessive physical demands or psychological pressures can influence these physiological reactions.

Behavioural reactions to work-related stressors have been the least explored of all strain indicators (Cooper, et al., 2001). Strain, in the context of job stress, means some type of deleterious condition of the individual that is due to job stressors. Therefore a behavioural strain would be a behaviour that is in itself harmful to the individual. According to Beehr (1995), poor performance and high rates of absenteeism are not necessarily instances of behavioural strain. Poor performance is likely to be harmful to the organisation but it is often not harmful to the person unless it is very extreme. Similarly, absenteeism is also usually harmful to the organisation, but not necessarily harmful to the individual. Performance and absenteeism may be influenced by stressors at work, but they are classified as organisational consequences of stress and not as individual strain (Beehr and Newman, 1978). Beehr (1995) suggested that examples of behavioural strain could include abuse of alcohol, tobacco, and drugs, over- or under-eating, suicide, risky behaviour (e.g. reckless driving), and behaviours leading to poor interpersonal relations (e.g. with family or friends). The keys to whether these are strains are (i) whether they are due to job stressors and (ii) whether they are deleterious to the individual personally. Kahn and Byosiere (1992) classified behavioural strain into five categories, which they labelled work role disruptions (e.g., errors, accidents), job flight (e.g., absenteeism, turnover), aggressive behaviours (e.g., vandalism, rumour spreading), disruptions to non-work life (e.g., interference with marital relationship), and self-damaging behaviour (e.g., substance abuse).

In the current research, I adopted psychological strain as a key consequence of the psycho-social work environment (e.g. high job demands and low job control). I employed the GHQ-12 scale to measure the levels of psychological strain among technical workers. I also assessed the mediating effects of psychological strain in the relationships between work design and the outcome variables. Due to the importance of preventing strain from occurring in the first place, I also examined the role of job control, social support, and self-efficacy in helping to reduce the

impact of job demands on psychological strain. I conceptualised these variables as moderators which may buffer the negative effects of job demands on psychological strain experienced by employees.

Moderators of Work Design-Strain Relationship

Most models of occupational stress suggest that poor work environments lead to negative psychological strain (e.g., Jex & Bliese, 1999). It is also suggested that stress experiences from unfavourable work conditions are moderated by job, and contextual and individual factors. Used in this sense, a moderator variable is one which affects the direction and/or strength of the relationship between a predictor variable (e.g., job demands) and a criterion variable (e.g., strain) (Baron & Kenny, 1986). Whilst mediating variables specify how an effect occurs, moderator analyses specify when such effects occur (Baron & Kenny, 1986). Research has looked for variables which might protect or buffer the individual from the negative effects of stressful work conditions. In the present study, I included job control, social support, and self-efficacy as moderators in the relationships between work design and psychological strain.

Job control

Although there are many features of the job itself which may act as moderators of the relationship between work design and strain, in the present study I included job control as a moderator. As stated earlier, *job control* refers to the extent to which individuals believe they can exert control over specific aspects of their job, such as the pace of work, procedures for task completion and scheduling of tasks (O'Driscoll & Cooper, 2002). The presence of job control may encourage individuals to believe that positive outcomes are possible, thus reducing feelings of threat and encouraging positive coping behaviours. According to Spector (2002), control in the workplace ranges from autonomy (control over the individual's own immediate scheduling and tasks) to participation in decision-making process (control over organisational decision-making process). Autonomy is an important aspect of the broader construct of control. With autonomous jobs, employees can determine the order and pacing of job tasks, specific procedures

for accomplishing those tasks, scheduling, and coordination with other employees and other conditions of work (Spector, 1986).

Karasek's (1979) Job Demands-Control model (JDC) proposed that strain develops from the combined influence of job demands and the extent of control over important decisions in the workplace. Where individuals have the capacity to influence decisions relevant to the completion of their tasks, the level of strain due to high job demands is likely to be diminished. In other words, job control buffers the effects of job demands on strain, such that high job demands lead to adverse reaction only among employees who have low job control. Employees with high job control see such demands as challenges to overcome rather than threats. However, research findings on the role of job control in stressor-strain relationships are very mixed, and some studies have not demonstrated a moderator effect (e.g., O'Driscoll and Beehr, 2000). Wall, Jackson, Mullarkey and Parker (1996) found a moderator effect of perceived job control only when that was explicitly adapted to the job demands experienced by employees. Similarly, Sargent and Terry (1998) observed a moderator effect for control over central areas of one's work, but not for more peripheral areas of control, suggesting that control over particularly important aspects of the work environment may be a critical factor in reducing strain.

Social support

The JDCS model suggests that social support (from co-workers, supervisors and other significant people) will buffer the impact of stressors on strain and other indicators of well-being. Numerous studies have demonstrated the important role that social support from other people can play in the alleviation of job-related strain and enhancement of positive well-being (Brough, O'Driscoll, Kalliath, Cooper, & Poelmans, 2009). Lee and Ashforth (1996) stated that employees with more support from others (e.g., supervisors or co-workers) experience lower levels of strain and burnout. Also, where an individual is faced with potentially stressful demands, conflicts and problems in the job, having support from others may reduce the impact of these pressures on that person's well-being (O'Driscoll & Cooper, 2002). Therefore, social support is expected to buffer or protect the individual from the negative consequences of work-related stressors.

Social support refers to helpful social interactions on the job with organisation, supervisors, and co-workers (Way & MacNeil, 2006). Social support is characterised by affective support (i.e., love, liking, and respect), confirmation (i.e., confirming the moral and factual “rightness” of actions and statements), and direct help (e.g., aid in work, giving information or money) (Frese, 1999). House (1981) distinguished four categories of social support: emotional support, appraisal support, instrumental support, and informational support. Emotional support refers to an awareness and understanding of the other person’s situation, along with caring and empathising with that person’s difficulties. Emotional support includes providing empathy, caring, love, and trust. Appraisal support involves the transmission of information that is relevant to self-evaluation. In other words, appraisal support provides feedback on the other person’s functioning that may enhance their self-esteem. Informational support entails giving information which may help individuals to deal with their problems, and instrumental support is providing various sorts of practical help to solve a problem.

Brough and colleagues (2009) noted that the effect of social support on work-related strain are based on three distinct ways:

- Social support may directly reduce strain. The explanation for this main effect is that support may increase a person’s self-esteem and feelings of self-worth, making them less vulnerable to the negative impact of stressors.
- Social support may serve as a mediator in the relationships between job stressors and strain. That is, job stressors influence social support, which in turn affects strain.
- Social support may serve as a moderator of the relationships stressors and strain. That is, when individuals utilise social support, the relationship between stressors and strain is reduced because support buffers them from potentially adverse effects of the stressors.

Previous research has concentrated predominantly on the direct and moderating (buffering) effects of social support (Brough, et al., 2009). The moderating effect of social support depends on a variety of factors (Brough, et al., 2009): (a) the individual wants to receive support; (b) the type of support is matched with the

stressors; and (c) it can actually assist the person in dealing with the stressful work environment. Individuals who receive social support are expected to experience less strain than those who do not receive such support, because support protects individuals from the potentially harmful consequences of stressful life events. This occurs instrumentally, by helping them deal with a problem, or emotionally, by modifying their perception that the stressor is damaging to their well-being (Cooper, et al., 2001). According to the stress-buffering model, the resources that people have access to when facing stressful life events buffer or protect them from the negative effects of stress (Sargent & Terry, 2000).

Research on the buffering model has considered the effects of a range of different coping resources, although much of the research has focused on whether access to high levels of social support buffers the negative effects of stress, where social support has typically been defined as the tangible and intangible support a person receives from other people (Brannon & Feist, 1992). However, inappropriate levels of support can induce more rather than less strain, resulting in a reverse buffering effect (Beehr, 1995).

My focus in this study was on work-based social support rather than more general (non-work) forms of support. I distinguished three sources of work-based social support, including perceived organisational support (POS), supervisor support, and co-worker support. POS can be conceptualised as an organisation-based resource, that is support stemming from the organisation (Kinnunen, Feldt, & Makikangas, 2008). POS refers to the person's perception of recognition by the organisation of an individual's socioemotional needs, efforts, commitment, and loyalty (Jain & Sinha, 2005). Organisational support theory (Eisenberger, Huntington, Hutchison, & Sowa, 1986) has proposed that employees develop a global belief concerning the extent to which their organisation values their contribution and cares about their well-being. Thus, organisational rewards and favourable job conditions such as pay and promotion contribute to POS, especially if the employee believes that they result from the organisation's voluntary actions (Rhodes & Eisenberger, 2002). As such, POS signals an employer's commitment to employees and is expected to influence their attitudes and behaviours (Eisenberger, et al., 1986). POS is also expected to reduce aversive physical, psychological, and behavioural reactions (e.g., strain) to

stressors through the availability of financial and emotional support when it is needed to face challenges in the workplace (Goerge, Reed, Ballard, Colin, & Fielding, 1993).

Supervisor support can be defined as the degree to which employees perceive that supervisors offer employees support, encouragement and concern (Burke, Borcki, & Hurley, 1992). Employees develop general views concerning the degree to which supervisors appreciate their contributions and care about their well-being (Eisenberger, Stinglhamber, Vandenberghe, Sucharski, & Rhoades, 2002). Perceived supervisor support is valued as a guarantee that aid will be available from the supervisor when it is needed to carry out one's job effectively and to deal with stressful situations (Randall, Cropanzano, Borman, & Birjulin, 1999). Supervisor support can be either instrumental and/or emotional support. Such support and encouragement may be useful in combating stressors at work (Young, Baltes, & Pratt, 2007). Supportive supervisors are seen as taking pride in their employees, compensating them fairly, and looking after their needs (Eisenberger, et al., 2002).

Co-workers support may constitute an important source of support especially when task accomplishment allows employees to interact with their co-workers (Paris, 2003). The support provided by co-workers may take different forms in the workplace, including emotional and instrumental support (Beehr, Jex, Stacy, & Murray, 2000). Co-worker support may generate positive feeling states that may enhance individuals' capacity to adapt to stressful situations. Indeed, a high level of co-worker support implies that individuals benefit from social recognition (Cohen, 1988), which may make them less sensitive to the stressful situation.

To summarise, it is evident that social support from co-workers and supervisors, and perceived organisational support can all play a significant role in the determination of levels of psychological strain.

Self-efficacy

In work design research, the moderators that have been most consistently recognised are growth-need strength, knowledge and skill, and context (Oldham, 1996). In response to changing job content, researchers have postulated a range of

other psychological moderators such as self-beliefs. For example, research has demonstrated the moderating effects of self-esteem (Ganster & Schaubroeck, 1991) as well as a general sense of competence (Bhagat & Allie, 1989). These studies have provided some support for the idea that stressors are less detrimental when individuals have more positive self-perceptions. One type of self-belief that has been researched quite extensively but has received relatively little attention is self-efficacy (Jex & Bliese, 1999; Jex, Bliese, Buzzell, & Primeau, 2001).

Self-efficacy refers to a belief in one's ability to successfully perform a task (Kurbanoglu, 2003). Bandura (1997) defined self-efficacy as the extent to which people believe they can perform behaviour to produce a desired outcome. Bandura (1997) believed that a sense of self-efficacy is a universally important component of individual and group functioning. Self-efficacy beliefs are a critical component of social cognitive theory. In other words, they influence the totality of human behaviour (Lu, Siu, & Cooper, 2005). Self-efficacy beliefs provide the foundation for human motivation, well-being, and personal accomplishment (Kurbanoglu, 2003). According to the above definition, self-efficacy is not concerned with the knowledge and skills one possess, but rather the judgement of what one can do with these. Specifically, self-efficacy refers to a sense of competence to exert control and mastery over one's environment. It also helps to determine how much effort individuals will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will be in the face of adverse situations (Kurbanoglu, 2003). Bandura's (1977) theory of social learning also defined self-efficacy as an individual's belief in his or her capability to execute a course of action needed to meet the demands of a situation.

The construct of self-efficacy represents one core aspect of social-cognitive theory (Bandura, 1997). In his theory of behaviour change, Bandura hypothesised that expectations of self-efficacy determine whether instrumental actions will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures. Efficacy beliefs influence how people think, feel, motivate themselves, and act (Bandura, 1997). In terms of feeling, a low sense of self-efficacy is associated with depression, anxiety, and helplessness. Persons with low self-efficacy also have low self-esteem, and they harbour pessimistic thoughts about their personal development. In terms of cognition, a

strong sense of competence facilitates cognitive processes and performance in a variety of settings, including quality of decision-making.

Bandura (1997) stated that there are three dimensions of self-efficacy beliefs:

- Magnitude, which refers to the level a person believes him/herself capable of performing a particular behaviour.
- Generality, which refers to the extent to which self-efficacy beliefs extend to other behaviours and situations.
- Strength, which refers to the resoluteness of people's convictions that they can perform the behaviour in question.

Self-efficacy beliefs are the result of learning processes. Social relationships play an important role in these learning processes. Bandura (1995) stated that people's beliefs concerning their efficacy can be developed by four main forms of influence. The most effective way of creating a strong sense of efficacy is through mastery experiences. Mastery experiences serve as direct indicators of capabilities. For example, success at a task, behaviour, or skill strengthens self-efficacy expectancies for that task, behaviour, or skill, whereas perceptions of failure diminish self-efficacy expectancy. Bandura (1995) argued that developing a sense of efficacy through mastery experiences involve acquiring the cognitive, behavioural, and self-regulatory tools for creating and executing appropriate courses of action to manage ever-changing life circumstances.

The second form of developing self-efficacy beliefs is through vicarious experiences (observational learning, modelling, and imitation). Vicarious experiences alter efficacy beliefs by observing other people performing similar tasks. They then use this information to form expectancies about their own behaviour and its consequences. Bandura (1995) stated that the effects of vicarious experiences depend on the observer's perception of the similarity to the model, the number and variety of models, the perceived power of the models, and the similarity between the problems faced by the observer and the model.

The next way to develop self-efficacy beliefs is verbal persuasion (or social persuasion) in which others can guide individuals to believe in their capabilities. People who are persuaded verbally that they have the capabilities to do a task are likely to muster greater effort and sustain it than if they have self-doubts when

problems arise (Litt, 1988). Maddux (1995) argued that the effectiveness of verbal persuasion to develop self-efficacy was influenced by the expertness, trustworthiness, and attractiveness of the source.

The last way to alter individual efficacy beliefs is based on the physiological and emotional states in judging their capabilities. People interpret their stress reaction as signs of one's vulnerability to dysfunction. Mood also influences people's judgements of their personal efficacy. Positive mood enhances perceived self-efficacy, whereas negative mood diminishes it (Maddux, 1995). Thus, people can develop efficacy beliefs by enhancing physical status, reducing stress and negative emotions, and correcting misinterpretations of bodily states (Bandura, 1995).

Self-efficacy is likely to be associated with variance in employees' reactions because it affects choice of coping behaviours and levels of persistence in overcoming job-related obstacles and stressors (Gist & Mitchell, 1992). Researchers have generally found that higher self-efficacy tends to be associated with problem-focused coping efforts, whereas lower self-efficacy is related to emotion-focused coping efforts (Chwalisz, Altmaier, & Russell, 1992). Problem-focused coping has been found to be more effective in dealing with stressors (Lazarus & Folkman, 1984), although in situations of little control, problem-focused coping efforts may be fruitless. High self-efficacy individuals may use coping methods that prevent stressors from occurring in the first place (Jex, et al., 2001). For instance, an employee with high self-efficacy may plan his or her workload in advance in order to avoid having to work frantically to meet tight deadlines. In addition, self-efficacy may influence the relationships between stressors and strain because individuals with high self-efficacy are more likely to believe they can maintain acceptable levels of job performance even with the presence of job-related stressors.

Conceptualisation of Outcome Variables

Previous studies indicate that strain potentially leads to many adverse consequences such as reduced job satisfaction, affective commitment, and job performance, and increased turnover intentions. Since this study focused on the impact of work design on psychological strain, I selected job satisfaction,

affective commitment, turnover intentions, and job performance as the focal consequences of psychological strain.

Job satisfaction

The study of job satisfaction has been prolific in industrial and organisational psychology. The continuing interest in job satisfaction is due to debate concerning the happy or productive worker (Wright, 2006). An influential definition of job satisfaction was advanced by Locke (1976), who defined it as “a pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences” (Locke, 1976, p. 1300). Job satisfaction comprises cognitive and affective reactions to an employee’s assessment of the amount of overlap between his/her expectations and the actual returns received from his/her current employment (Carmeli & Weisberg, 2006). Job satisfaction is a specific job attitude that involves both thoughts and feelings (Ilies & Judge, 2002).

Job satisfaction theories argue that satisfaction is related to the process of motivation. For example, equity theory (Adams, 1965) states that perception of job satisfaction is based on the evaluation of inputs that employees have contributed (skills, experience, amount of time worked) and outcomes they receive as the rewards from their job (pay, promotion, recognition). Another theory is expectancy theory by Vroom (1965). This theory proposed that work effort is directed towards behaviours that are believed will lead to desired outcomes. Job satisfaction or dissatisfaction results from the discrepancy between expected and actual outcomes (Vroom, 1965).

Industrial/organisational psychologists often use job satisfaction as an indicator of psychological strain (Beehr, 1995). Job satisfaction is often related to many potential stressors, although by itself it probably does not indicate the presence of stress (Beehr, 1995). Beehr (1995, p.112) argued that “dissatisfaction is in most ways a milder reaction to work than true strains are”. Strains are likely to be experienced as actual mental or physical illness (Beehr, 1995). Even job dissatisfaction is not truly a strain, it is still valuable to include it as a potential outcome in job stress studies. Beehr (1995) and Beehr, Glaser, Canali, and Wallwey (2001) proposed that researchers should measure job dissatisfaction as an outcome separate from strain. Job satisfaction can even be employed in job

stress studies in ways that would help to illustrate the nature of some stressors. Job satisfaction could also be important in stress if it leads to other outcomes.

Antecedents of job satisfaction can be classified into two major categories (Spector, 1997). Firstly, the job environment itself and factors associated with the job are important determinants of job satisfaction. As stated by Saari and Judge (2004), work itself is one of the most important areas of the work situation influencing job satisfaction. This includes how people are treated, the nature of job tasks, relations with other people in the workplace, and rewards. This is consistent with situational theory, which proposes that job satisfaction is determined by situational characteristics (Quarstein, McAfee, & Glassman, 1992). Situational characteristics are relatively finite and stable variables such as working conditions, career opportunities, reward systems and company policy. Previous research, for example Fox et al. (1993), found that perceived workload interacted significantly with control to predict job satisfaction. High levels of perceived workload with low levels of job control were associated with lower job satisfaction. Landsbergis et al. (1992) found that employees in high-strain jobs had a significantly higher level of job dissatisfaction than low-strain groups. Parkes et al. (1994) found significant demand x control interaction effects on job satisfaction in a study of health care workers. In a similar vein, Yeung and Tang (2001) showed that job satisfaction was correlated with high job control.

Secondly, there are individual factors that a person brings to the job. These include both personality and prior experience. Dispositional theory argues that individual factors (e.g., personality traits) are more important than situational factors in influencing job satisfaction (Judge & Larsen, 2001). Staw and Cohen-Charash (2005) proposed that “dispositions may influence the conditions an individual faces at work, how he or she perceives, evaluates, stores in memory and recalls from memory” (p. 73). They concluded that dispositional affect can provide theoretically and empirically robust explanations of attitudes such as job satisfaction.

The current study examined the impact of psychological strain on job satisfaction and job satisfaction as a mediator in the relationship between psychological strain and job performance. In other words, to the extent that employees view high

psychological strain as part of an exchange, those who suffered from reduced job satisfaction will be more likely to have lower job performance.

Affective commitment

Organisational commitment has generally been defined as an attachment or identification with the organisation (Mathieu & Zajac, 1990). Levy (2003) defined organisational commitment as the relative strength of an individual's identification with, and involvement in, an organisation. It can also be seen as an emotional response to a positive appraisal of the work environment (Testa, 2001). Such an emotional response may be considered an attachment, particularly when the individual believes strongly in the organisation's values and goals or demonstrates a strong desire to maintain membership in the organisation (Scholarios & Marks, 2004). Employees with high levels of organisational commitment are more work-oriented than other employees (Van Scoter, 1999). They get more satisfaction from work and view their jobs as fulfilling more of their personal needs. As a result, they are willing to exert considerable effort on behalf of the organisation (Mowday, Porter, & Steers, 1982).

The most frequently used conceptualisation of commitment is the three-component model developed by Meyer and Allen (1991). This model has been subjected to empirical scrutiny and has arguably received the greatest support (Meyer, Vandenberghe, & Becker, 2004). Meyer and Allen (1991) defined organisational commitment as consisting of three separate concepts: affective, continuance, and normative commitment. *Affective commitment* refers to feelings of belonging and a sense of attachment to the organisation (Meyer & Allen, 1991). Employees with high affective commitment will continue to stay in the organisation because they want to. *Continuance commitment* relates to perceived costs of leaving the organisation, including a perceived lack of alternatives (Meyer & Allen, 1991). Employees with strong continuance commitment will remain in the organisation because they feel they need to. Meanwhile, *normative commitment* manifests a feeling of obligation to remain with an organisation (Meyer & Allen, 1991). Employees with a high level of normative commitment feel that they ought to remain with the organisation (Bolon, 1997).

To date, the three-component conceptualisation of organisational commitment can be regarded as the dominant model in organisational commitment research (Solinger, van Olffen, & Roe, 2008). However, the three-component of organisational commitment is not fully consistent with empirical findings (Ko, Price, & Mueller, 1997). Some scholars have argued that empirical inconsistencies derive from deeper rooted problems regarding the underlying concepts (Solinger, et al., 2008). Empirical criticism of the three-component of organisational commitment has mainly revolved around two construct validity topics – that is, the position of continuance commitment as a dimension of the overall commitment construct, and the relation between normative and affective commitment (e.g., Cohen, 2003). Empirical dimensionality problems prompted Meyer and colleagues to revise and improve the instruments used for measuring continuance and normative commitment (Solinger, et al., 2008). However, it seems that the underlying problem with these components is conceptual rather than empirical in nature (Bergman, 2006). Therefore, Ko, Price, and Mueller (1997) proposed a return to the view that organisational commitment refers only to affective attachment. In addition, affective commitment represents the most reliable and strongly validated dimension of organisational commitment (Cohen, 2003).

Social exchange theory also concluded that commitment is an affective state (Putterill & Rohrer, 1995). Among the three components of Meyer and Allen's (1991) theory, affective commitment exists as an important dimension of commitment toward their organisations (Rhodes, Eisenberger, & Armeli, 2002). Affective commitment is “positive feelings of identification with, attachment to, and involvement in, the work organisation” (Meyer & Allen, 1984, p.375). It is one of the three forms of organisational commitment and denotes an emotional attachment to the organisation. Affective commitment was found to correlate most strongly with job performance. For example, in their meta-analysis, Meyer, Stanley, Herscovitch, and Topolnytsky (2002) reported corrected correlations of affective commitment, normative, and continuance commitment with performance (0.16, 0.06, and -0.07) and OCB (0.32, 0.24, and -0.01). Previous research also argued that strain is strongly related to affective commitment rather than to

continuance and normative commitment. Consequently, I considered affective commitment to be the most relevant for my research purpose.

Turnover intentions

Over the past few years, scholars have been directing much effort into investigating employees' turnover intentions towards their organisation (Carmeli & Weisberg, 2006). Acknowledging the strategic importance of human capital, organisations adapt the strategic practices of human resource management to recruit, develop and retain this valuable asset. Retaining human capital is very important in the ever-increasing competition to employ the most valuable employees in the marketplace (Carmeli & Schaubroeck, 2005). Managers and researchers consider turnover a problem because of costs associated with it (Noor & Maad, 2008).

Turnover intentions refer to the subjective estimation of an individual regarding the probability that she or he will leave the organisation in the near future (Mobley, 1982). It is conceived to be a conscious and deliberate desire to leave the organisation within the near future, and considered as the last part of a sequence in the withdrawal cognition process (Mobley, Horner, & Hollingsworth, 1978), which also includes thoughts of leaving and intentions to seek out alternatives (Tett & Meyer, 1993), in either a passive or an active job search (Kirschenbaum & Weisberg, 1994). Tett and Meyer (1993) noted that turnover intentions are identified as the immediate precursor to turnover behaviour. Identification of the variables contributing to turnover intentions is considered to be effective in reducing actual turnover levels (Maertz & Campion, 1998). In this study, turnover intentions refers to three elements in the withdrawal cognition process – *thoughts of quitting, the intention to search for another job elsewhere and the intention to quit* (Mobley, et al., 1978).

The relationship between turnover intentions and actual turnover may vary across studies (Carmeli & Weisberg, 2006). The relationship between turnover intentions and actual turnover may depend on the employee's motivational basis and other opportunities for employment (Vandenberg & Nelson, 1999). Tett and Meyer (1993) showed that there is consistent evidence that turnover intentions are the "strongest cognitive precursor of actual turnover" (p.262). Meta-analyses by

Griffeth, Hom, and Geartner (2000) and Hom and Griffeth (1995) showed that intentions to quit are a major predictor of actual turnover.

Cotton and Tuttle (1986) stated that three primary groups of variables have been identified as influencing turnover intentions. First come the organisational variables, such as job satisfaction, occupational stress and gender discrimination; secondly are individual demographic variables, including gender, marital status and tenure; and lastly are the external variables, such as the availability of alternative employment. The relationship between turnover intentions and organisational variables is of particular importance, with considerable attention being applied to low job satisfaction and high psychological strain (George & Jones, 1996; O'Driscoll & Beehr, 1994). These studies largely provide support for the two-step sequence model according to which stressful work affects turnover intentions via psychological strain (De Croon, et al., 2004). A study by Moore (2000) found that psychological strain partially mediated the effect of working conditions on turnover intentions.

Job performance

Job performance refers to the effectiveness of individual behaviours that contribute to organisational objectives (Motowidlo, 2003). In the literature, job performance is usually divided into in-role performance (task performance) and extra-role performance (organisational citizenship behaviour (OCB) or contextual performance) (Riketta, 2008). In-role performance can be defined as fulfilment of tasks that are required by the formal job description. Extra-role performance or OCB can be defined as behaviour that is beneficial to the organisation and goes beyond formal job requirements (e.g., helping co-workers at work, working extra hours, making suggestions for improvement (Borman & Motowidlo, 1997). OCB represents “individual behaviour that is discretionary, not directly or explicitly recognised by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organisation” (Organ, 1988, p.4). Contextual activities are essential because they contribute to organisational effectiveness and shape the organisational, social, and psychological context that serves as the catalyst for task activities and processes (Borman & Motowidlo, 1997). William and Anderson (1991) suggested two broad categories of OCB: (a)

OCBO-behaviours that benefit the organisation (e.g., gives advance notice when unable to come to work) and (b) OCBI-behaviours that immediately benefit specific individuals and indirectly through this means contribute to the organisation (e.g., helps others who have been absent).

Organ, Podsakoff, and MacKenzie (2006) argue that OCBs are often considered to be part of an employee's role responsibility. Their argument is supported by the previous research showing that some employees (Morrison, 1994) and some managers (Lam, Hui, & Law, 1999) believe that OCBs are part of the employee's role responsibilities. Indeed, Morrison (1994) found that the percentage of employees who viewed specific types of OCB as being an expected part of the job ranged from a low of 32% to a high of 88%.

Job performance is one of the outcomes in job design research (Hackman & Oldham, 1980; Parker & Wall, 1998). Beehr et al. (2000) found that job performance was affected by stressors such as strain. According to Jex (1998), even though the relationship between work characteristics and job performance is not strong, job demands, control and social support appear to have an impact on performance, influencing employees' motivation and effort. On the other hand, researchers have argued that poor physical and mental health has a negative impact on employees' performance (Jex, 1998; Wright & Cropanzano, 2000). However, work characteristics have not been found to have a direct effect on performance, but rather an influence mediated by individuals' well-being (Danna, 1999; Sargent & Terry, 1998). Wright and Cropanzano (2004) found that psychological well-being significantly predicted not only contemporaneous employee performance, but also subsequent supervisory performance ratings. In addition, psychological well-being remained significantly related to performance even after controlling for employee age, gender, ethnicity, job tenure, and education attainment level in a series of studies involving well-paid management personnel from a variety of different organisations and occupations (Wright & Cropanzano, 2004). Likewise, Chambel and Curral (2005) found that psychological well-being (i.e. satisfaction) mediated the relationship between job control and performance.

Empirically, there has been a relatively large number of studies that included job performance as an outcome of strain (Koslowsky, 1998). For example, Rabinowitz and Stumpf (1987) indicated that the source of stress may be important in determining whether performance is affected. However, in their study job stress was not shown to affect job performance. Koslowsky (1998) stated that the relationship between stressors and performance is quite complex. Thus, in the present study I examined the influence of the work design variables on psychological strain first, and then the effects of psychological strain on job performance. I also tested the mediating effects of job satisfaction, affective commitment, and turnover intentions in the relationships between psychological strain and job performance. A more detailed description and explanation of the theoretical model constructed for this research is presented in Chapter 3.

Chapter Summary

Based on the literature, it is clear that psychological strain serves as a link between work design and the proposed outcomes of psychological strain. In my study, work design refers to psychosocial work conditions such as job demands and job control. The proposed outcomes of psychological strain include job satisfaction, affective commitment, turnover intentions, and job performance. Building upon the JD-R model, my research also focused on the moderating effects of job control, social support, and self-efficacy in the relationships between job demands and psychological strain. At the same time, I predicted direct effects of these variables on psychological strain. In addition, my research included the mediation effect of psychological strain in the relationship between work design variables and work attitude outcomes (i.e. job satisfaction, affective commitment, and turnover intentions). Moreover, I predicted the mediation effects of these work attitudes in the relationships between psychological strain and job performance. Chapter 3 outlines the theoretical model and hypotheses for the present study.

CHAPTER 3

THEORETICAL MODEL AND HYPOTHESES

Chapter Overview

This chapter presents the theoretical model and hypotheses of this study in two major sections. The first section explains the theoretical model of this study. The second section discusses the hypotheses of this study, which are grouped into three types – main effects, moderating effects and mediating effects. The main effects are those of work design variables on psychological strain, those of psychological strain on job satisfaction, affective commitment, turnover intentions, and job performance, and those of job satisfaction, affective commitment and turnover intentions on job performance. The moderating effects are those of job control, social support, and self-efficacy in the relationship between job demands and psychological strain. The mediating effects are those of psychological strain in the relationship between work design and the work attitude variables, and those of job satisfaction, affective commitment and turnover intentions in the relationship between psychological strain and job performance.

Theoretical Model

Figure 3.1 represents the theoretical model utilised in this research. The theoretical model is divided into four parts: work design variables, moderators, psychological strain and the outcomes of psychological strain (i.e. job satisfaction, affective commitment, turnover intentions, and job performance).

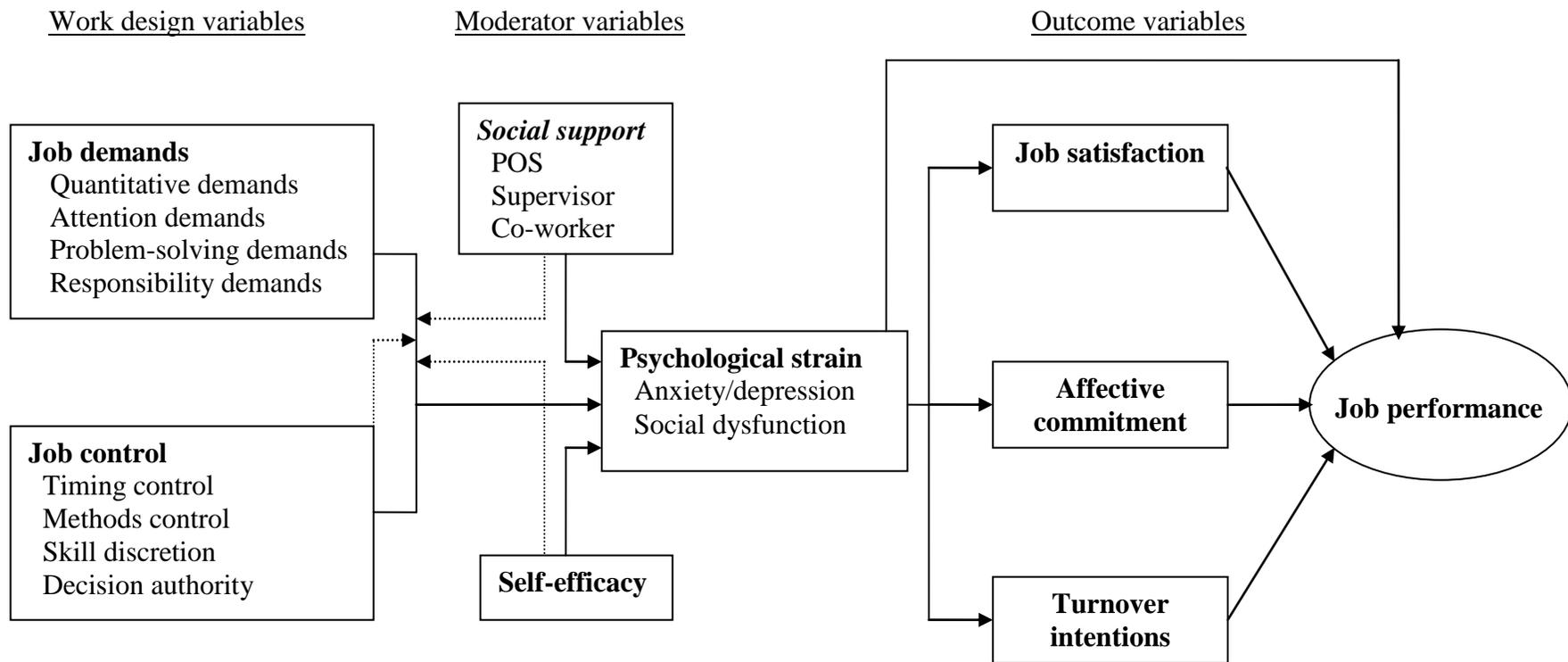


Figure 3.1. Theoretical Model

Note.► indicates moderation effects.
 —► indicates direct effects.

The first part of the theoretical model is work design. Work design refers to the psychosocial work characteristics and serves as the main predictors. Many of the previous studies have shown that work characteristics can have a profound impact on employee well-being (e.g. job strain) (Bakker & Demerouti, 2007). The Job Demands-Resources (JD-R) model incorporates many possible working conditions, and focuses on both negative and positive indicators of employee well-being. The JD-R model proposed that the psychosocial work characteristics can be categorised into two general groups: job demands and job resources. Job demands refer to those physical, psychological, social, or organizational aspects of job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs. Although job demands are not necessarily negative, they may turn into job stressors when meeting those demands requires high effort from which the employee has not adequately recovered (Meijman & Mulder, 1998).

Job resources refer to those physical, psychological, social, or organisational aspects of the job that are: (1) functional in achieving work goals; (2) reduce job demands and the associated physiological and psychological costs; and (3) stimulate personal growth, learning, and development. Hence, resources are not only necessary to deal with job demands, but they also are important in their own right. This is in line with Hackman and Oldham (1980) job characteristics theory that emphasizes the motivational potential of job resources at the task level, including autonomy, feedback, and task significance. In addition, this agrees on a more general level with Conservation of Resources (COR) theory (Hobfoll, 2001) that states that the prime human motivation is directed towards the maintenance and accumulation of resources. Accordingly, resources are valued in their own right or because they are a means to the achievement or protection of other valued resources. Job resources may be located at the level of the organisation at large (e.g., career opportunities and job security), the interpersonal and social relations (e.g. supervisor and co-worker support), the organisation of work (e.g. participation in decision making), and at the level of the task (e.g. skill variety and task identity).

In the present study, job demands reflect the amount of work required from the employee, such as the extent to which he or she has to work under time pressure,

and the degree to which the employee is expected to complete conflicting job demands. I categorized job demands into four variables: quantitative demands, attention demands, problem-solving demands, and responsibility demands. *Quantitative demands* refer to work that requires hard work and fast, excessive work, time pressure and conflicting demands. *Attention demands* concern the degree to which constant monitoring of work is required. *Problem-solving demands* refer to the more active cognitive processing requirements of a job. *Responsibility demands* refer to the extent to which the individual can make errors which can result in a costly loss of output.

I included three types of job resources in this study, namely job control, social characteristics, and individual differences. Job control refers to the extent that employees can exert influence over tasks and conduct during a normal working day. In the present study, job control consists of four constructs - skill discretion, decision authority, timing control, and method control. *Skill discretion* refers to employee opportunities to develop their own skills, plan their work environment, learn new things and be creative. *Decision authority* refers to employee freedom to decide how to perform their work. *Timing control* refers to an individual's ability to determine the scheduling of his or her own work. *Method control* refers to an individual's choice of how to carry out given tasks. Following the JDC and JD-R models, job control was also predicted to moderate the relationship between job demands and psychological strain.

The next type of the job resources focuses on the roles of social characteristics (i.e. social support) and individual differences (i.e. self-efficacy). Social characteristics are important component of work (Humphrey, et al., 2007) and play a critical role in shaping employees' experiences and behaviours (Grant & Parker, 2009). Social characteristics are likely to impact a variety of work outcomes such as employee well-being, particularly for jobs that are stressful or lack many motivational work characteristics (Morgeson & Humphrey, 2006). Social support reflects the degree to which a job provides opportunities for advice and assistance from others (Morgeson & Humphrey, 2006). The job demands-control-support (JD-CS) model expands the job demands control (JDC) model, predicting the negative outcomes in jobs characterised by high strain combined with low support. The corresponding buffer hypothesis states that social support

moderates the negative impact of high job demands and low job control on strain. In the current study, I expected that social support has both a main effect on psychological strain and a moderating effect in the relationship between job demands and psychological strain. Social support variables function as moderators as they provide resources for employees to deal with the impact of job demands. I divided social support into three constructs – perceived organisational support (POS), supervisor support and co-worker support. Additionally, I proposed that individual differences in self-efficacy have both a main effect on psychological strain and a moderating effect on the relationship between job demands and psychological strain. Individual differences might affect employees' perceptions of work design characteristics. Self-efficacy reflects the employees' confidence in their ability to carry out their job tasks (Bandura, 1997).

The second part of the model postulates that psychological strain results not from either aspect of the work environment alone, but from the joint effects of the level of job demands and the degree of job resources available to the employee. In other words, the model predicts that job strain results from the interaction of job demands and job resources. Psychological strain is hypothesised to exist when there are high levels of job demands and low levels of job resources (i.e. job control, social support, and self-efficacy) over the demands. Alternatively, when high levels of job demands and job resources exist the job is described as being active, meaning that when resources is high the demands act as a source of challenge and regeneration, rather than as a source of psychological strain.

The third part of the theoretical model examines psychological strain, which was expected to have a main effect on job satisfaction, affective commitment, turnover intentions, and job performance. Psychological strain refers to negative psychological states (i.e., anxiety/depression and social dysfunction) arising in response to situations involving perceived threat to employee well-being. In the present study, high job demands and low job control were expected to lead to higher strain, which in turn would affect employees' job satisfaction, affective commitment, job performance, turnover intentions, and job performance. I also proposed that psychological strain would mediate the relationship between work design and the work attitude variables (i.e. job satisfaction, affective commitment, and turnover intentions).

The last part of the theoretical model involves the work outcomes variables, including job satisfaction, affective commitment, turnover intentions, and job performance. I expected that job satisfaction, affective commitment, and turnover intentions would have direct effects on job performance. I also predicted that job satisfaction, affective commitment and turnover intentions would mediate the relationships between the psychological strain components and job performance. Job performance serves as the final criterion variable in the current research. This theoretical model was tested both cross-sectionally and longitudinally.

Hypotheses of the Study

In this section, I present the hypotheses of this study based on both cross-sectional and longitudinal analyses. Each of the hypotheses is discussed next.

Job demands

The concept of job demands gained importance in the work stress literature during the 1970s (Karasek, 1979; Payne, 1979). Job demands are defined as workload demands, conflicts or other stressors which place the individual in accomplishing the workload, stressors related to unexpected tasks, and stressors of job-related personal conflict (Karasek, 1979). Karasek (1979) classified job demands as the psychological demands of work, including mental workload, constraints on task completion, and conflicting demands. Karasek (1997) referred to “the demands of modern workplaces such as the intensity of output per hour, time pressure, concentration, and social pressures” (p.57). Holman and Wall (2002) also defined job demands as psychological stressors involved in accomplishing work. Job demands reflect “the amount of work required from the employee, the extent to which he or she has to work under time pressure, and the degree to which the employee is expected to complete conflicting job demands” (Sargent & Terry, 1998, p. 219). According to Bakker et al. (2003), job demands refer to those physical, psychological, social or organisational aspects of the job that require sustained physical or psychological (cognitive and emotional) effort and are therefore associated with certain physiological and psychological costs. Karasek and Theorell (1990, pp., p. 63) defined job demands as “how hard you have to

work, include deadlines, how many widgets you make per hour, and how many reports are due this week” (p. 63).

Previous researches have helped to refine the job demands construct by proposing and clarifying possible sub-constructs. For instance, Jackson, Wall, Martin, and Davids (1993) distinguished between monitoring demands, problem-solving demands, and production responsibilities. Wall, Jackson, and Mullarkey (1995) also included mental demands of work, such as attention demands and problem-solving demands. “The identification of these two demands is important because it helps clarify how work design can actually impact the information-processing requirements of work” (Morgeson & Campion, 2003, p. 434). Dwyer and Ganster (1991) expanded on the distinction between psychological demands (e.g., precision requirements) and physical demands (e.g., muscular exertion), at least as these are experienced by manufacturing employees. Soderfeldt, Soderfeldt, Muntaner, O’Campo, Warg, and Ohlson (1996) discussed the distinction between workload demands, emotional demands, conflict between competing demands, and, possibly, role ambiguity demands, particularly applied to workers in human services organisations.

In various studies the measurement of demands has been expanded and new items included (De Jonge, et al., 2001; Kristensen, Bjorner, Christensen, & Borg, 2004; Mikkelsen, Ogaard, & Landsbergis, 2005; Mikkelsen, et al., 1999). In the National Danish Psychosocial study, for example, five different scales for psychological demands at work were included: quantitative demands, emotional demands, cognitive demands, responsibility demands, and sensorial demands (Mikkelsen, et al., 2005).

Many theories of occupational stress propose that demanding jobs are associated with higher levels of strain than are less demanding jobs (Demerouti, et al., 2001; Karasek, 1979; Karasek & Theorell, 1990). Numerous studies have demonstrated that psychological demands influence psychological strain (see a review by van der Doef & Maes, 1999). The effects of job demands have been demonstrated using a wide range of strain measures, including job stress/anxiety (e.g., Parker & Sprigg, 1998; Vermeulan & Mustard, 2000), emotional exhaustion and/or burnout (e.g., De Jonge, Janssen, & van Breukelen, 1996; De Rijk, Le Blanc, Schaufeli, &

De Jonge, 1998), and general psychological health (e.g., Beehr, et al., 2001). Job demands have also been found to predict physiological stress reactions (e.g., Aronsson & Rissler, 1998), and behavioural stress reactions such as absence due to sickness (e.g., Vahtera, Kivimaki, Pennti, & Theorell, 2000).

Job demands serve as stressors that cause strain (LePine, Podsakoff, & LePine, 2005). This perspective suggests that job demands are the stimuli that evoke the stress process, and psychological strain is the outcome in this process. Early research on job demands envisioned a U-shaped relationship, with either high or low levels of demand associated with high strain and moderate levels of demand associated with lower strain (French, Caplan, & Harrison, 1982). In practice, however, perhaps because job demands tend to fall toward the higher end of the distribution (from moderate to high), the predominant finding has been a positive relationship with strain (Holman & Wall, 2002). Recent studies of job demands have illustrated that they are predictors of production workers' level of exhaustion and cynicism (Bakker, Demerouti, Taris, et al., 2003), as well as emotional exhaustion, depersonalisation, and personal accomplishment (Dollard, Winefield, Winefield, & De Jonge, 2000). A study by te Doest et al. (2006) found that higher job demands are associated with unfavourable job attitudes and well-being deficits. Mikellsen, Ogaard, and Landsbergis (2005) showed that quantitative demands, emotional demands and risk demands were uniformly positively associated with subjective health complaints and stress.

To conclude, the current study defined job demands as a subset of potential work stressors and as a source of strain among technical workers. Job demands include general and specific events that occur at work, as well as the psychosocial conditions of work. It is clear that job demands influence psychological strain among employees. Specifically, I tested the following hypotheses:

Cross-sectional hypotheses

Hypothesis 1: Job demands will be positively related to psychological strain at both Times 1 and 2.

H1a: Job demands will be positively related to levels of anxiety/depression at both Times 1 and 2.

H1b: Job demands will be positively related to levels of social dysfunction at both Times 1 and 2.

Longitudinal hypotheses

Hypothesis 2: Job demands will be positively related to psychological strain over time.

H2a: Job demands at Time 1 will be positively related to anxiety/depression at Time 2.

H2b: Job demands at Time 1 will be positively related to social dysfunction at Time 2.

Job control

Control is seen as important for psychological well-being (Meier, Semmer, Elfering, & Jacobshagen, 2008). Theorists have argued that lack of perceived control is central in the development of depression (e.g., Seligman, 1975). The concept of control is also a central component of Karasek's (1979) JDC model. Job control can be defined as the extent of authority to make decisions concerning the job (Karasek, 1979), and focuses attention on how jobs allow individuals to manage and execute their primary job tasks (Wall, Wood, & Leach, 2004). Job control refers to "the extent that employees can exert influence over tasks and conduct during the normal working day" (Sargent & Terry, 1998, p. 219). Job control also refers to an individual's ability to choose his or her own actions from two or more options (Ganster & Fusilier, 1989). Hackman and Oldham (1980) defined job control as "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (p.79). Job control is a situational factor because it reflects the individual's perception of their work environment rather than cross-situational dispositional beliefs (Cooper, et al., 2001). In this sense it is conceptually and empirically distinct from the dispositional construct, locus of control.

Karasek (1979) categorised job control as skill discretion and decision authority. Both McLaney and Hurrell (1988) and Carayon and Zijlstra (1999) derived four domains of job control, namely, control over tasks, decisions, environment, and resources. Wall et al. (1995) have further clarified two aspects of work control. They included timing control and method control. Timing control reflects the opportunity to determine the scheduling of work. Method control refers to the

choice of how to carry out tasks. “These aspects of autonomy more precisely specify the kind of freedom and independence individuals have in carrying out their work assignments and accountability they face if something goes wrong” (Morgeson & Campion, 2003, p. 434).

According to Shimazu, De Jonge, and Irimajiri (2008), job control including method, location, scheduling, and how tasks are done were important to any type of work. Job control is important at three points in the job-stress process (Spector, 2002):

- Job control has an effect on the perception of workplace conditions and events. However, the control must be over the stressful situation itself to be effective in reducing perceived stressors.
- Job control helps employees minimise emotional reactions to job stressors (e.g., job demands). If a person perceives control over the work situation, he or she will believe the magnitude of the stressor can be contained within tolerable limits. Thus, the person’s reaction might be the positive feeling of challenge rather than a negative emotion.
- Job control has an effect on a person’s choice of coping strategy. Perceived control tends to lead to constructive coping, whereas perceived lack of control is more likely to lead destructive coping.

De Croon and colleagues (2004) argued that lack of job control may frustrate the intrinsic need to be competent in interacting with the working environment, thus influencing strain in a direct manner. Theoretically, it is argued that the interaction between job control and job demands is most important for the prediction of strain. However, previous studies have provided most support for the main effects of job control on psychological strain (see review in van der Doef & Maes, 1999), physiological strain (e.g., Steptoe, 2001), and behavioural strain (e.g., Kivimaki, et al., 1997).

The present study defined job control as technical workers’ perceptions of their current, personal capacity to influence task and social dimensions of their work environment. Following prior literature, I expected that job control would have both direct and moderating effects on psychological strain. Karasek (1979) suggested an interaction effect between job demands and control on worker

health. Job control is seen as an important means to reduce work pressure, which has been shown to be an important work stressor in different occupations (Frese, 1989; Karasek & Theorell, 1990). Correspondingly, as O'Driscoll and Cooper (1996) stated, numerous studies have demonstrated that absence of discretion and control are consistent predictors of job-related strain.

In the workplace, research consistently finds a relationship between high levels of job control and positive outcomes (Sargent & Terry, 2000). Terry and Jimmieson's (1999) review reported consistent evidence that high levels of worker control are associated with low levels of stress-related outcomes, including anxiety, psychological distress, burnout and psychological somatic health complaints. Dollard et al. (2000) found that job control was positively related to personal accomplishment as well as job satisfaction and Gelsema et al. (2005) found that there is a link between job control and job satisfaction. They used skill discretion and decision authority to measure job control. This is in line with results from other studies (De Jonge & Schaufeli, 1998; Irvine & Evans, 1995; Tonges, Rothstein, & Carter, 1998). In academic life, Chambel and Curren (2005) found that job control was positively associated with satisfaction and negatively related to anxiety and depression. They also found that job control had a significant main effect on well-being. Conversely, lack of control has been found to have a positive relationships with strain (Way & MacNeil, 2006), frustration, anxiety, job dissatisfaction, and turnover intentions (Liu, Spector, & Jex, 2005).

In many studies on job control, the concept of control has been conceptualised and measured as a single dimension, usually referred to as 'decision latitude' (Karasek, 1979; Karasek & Theorell, 1990). However, some researchers have proposed a multi-faceted conceptualisation of control (Dwyer & Ganster, 1991; Jackson, et al., 1993; Smith, Tisak, Hahn, & Schmieder, 1997). The question of the dimensionality of the job control concepts has received some attention in the occupational stress literature. For instance, some researchers have proposed conceptualisations of different facets and levels of job control (e.g., Hurrell & McLaney, 1989; Sainfort & Carayon, 1991). Moreover, Gardel (1982) and Sainfort and Carayon (1991) distinguished three types of control: (i) instrumental control, which is related to influence over the tasks (task order, pace, amount of work); (ii) conceptual control, which is related to the context where tasks are

accomplished and the working methods; (iii) decision control, which is related to influence over organisational processes, procedures and policies. Wall et al. (1995) examined two different aspects of job control: timing control and methods control. Timing control refers to the individual's opportunity to determine the scheduling of his or her own work, whereas method control refers to the choice of how to carry out given tasks. Carayon and Zijlstra (1999) proposed that different facets of job control had a different effect on strain. For example, task control had a negative effect on work pressure and strain, whereas personal control had a positive effect on work pressure and strain (Carayon & Zijlstra, 1999).

Accordingly, I tested four facets of job control, including timing control, methods control, skill discretion, and decision authority. A broader multi-dimensional of job control would enable examination of the effects of specific control dimensions and their interaction. Specifically, I tested the following hypotheses:

Cross-sectional hypotheses

Hypothesis 3: Job control will be negatively related to psychological strain at both Times 1 and 2.

H3a (i): Timing control will be negatively related to anxiety/depression at both Times 1 and 2.

H3a (ii): Timing control will be negatively related to social dysfunction at both Times 1 and 2.

H3b (i): Methods control will be negatively related to anxiety/depression at both Times 1 and 2.

H3b (ii): Methods control will be negatively related to social dysfunction at both Times 1 and 2.

H3c (i): Skill discretion will be negatively related to anxiety/depression both at both Times 1 and 2.

H3c (ii): Skill discretion will be negatively related to social dysfunction at both Times 1 and 2.

H3d (i): Decision authority will be negatively related to anxiety/depression at both Times 1 and 2.

H3d (ii): Decision authority will be negatively related to social dysfunction at both Times 1 and 2.

Longitudinal hypotheses

Hypothesis 4: Job control will be negatively related to psychological strain over time.

- H4a (i): Timing control at Time 1 will be negatively related to anxiety/depression at Time 2.
- H4a (ii): Timing control at Time 1 will be negatively related to social dysfunction at Time 2.
- H4b (i): Methods control at Time 1 will be negatively related to anxiety/depression at Time 2.
- H4b (ii): Methods control at Time 1 will be negatively related to social dysfunction at Time 2.
- H4c (i): Skill discretion at Time 1 will be negatively related to anxiety/depression at Time 2.
- H4c (ii): Skill discretion at Time 1 will be negatively related to social dysfunction at Time 2.
- H4d (i): Decision authority at Time 1 will be negatively related to anxiety/depression at Time 2.
- H4d (ii): Decision authority at Time 1 will be negatively related to social dysfunction at Time 2.

Whereas the above hypotheses predicted direct relations between job control and strain, Karasek's (1979) JDC model proposes that the level of job control interacts with job demands to influence outcomes. Job control is theorised to buffer the effects of job demands, such that high demand jobs lead to adverse reactions only among employees who have low control. Employees with high control tend to see such demands as challenges to be overcome rather than threats. When an individual has a great deal of pressure, yet no control, the situation is proposed to be particularly undesirable.

Although Karasek provided some initial support for the buffering effect, results across studies have been equivocal (Jones & Fletcher, 1996; O'Driscoll & Dewe, 2001). A number of studies have either not obtained the predicted interaction between demands and control or have only found very small interaction effects (Bishop, et al., 2003). Terry and Jimmieson (1999) discussed how the interaction effect of job control was hard to find. Although control has been shown to relate

to strain, only some studies have found that it acts as a buffer. Past research that tested Karasek's (1979) JDC model has failed to find conclusive evidence of job control and job demands interactions in predicting employee adjustment, although there is evidence of a significant main effect of job control on levels of well-being (e.g., Dwyer & Ganster, 1991; Sargent & Terry, 1998). In part this may be because tests of the theory have not looked at specific aspect of job control over stressors (Spector, 2002).

Therefore, I tested the interaction effects of four facets of job control – timing control, methods control, skill discretion, and decision authority. Specifically, I tested the following hypotheses:

Cross-sectional hypotheses

Hypothesis 5: Job control will moderate the relationship between job demands and psychological strain at both Times 1 and 2.

H5a (i): Timing control will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when timing control is low than when timing control is high.

H5a (ii): Timing control will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when timing control is low than when timing control is high.

H5b (i): Methods control will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when methods control is low than when methods control is high.

H5b (ii): Methods control will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when methods control is low than when methods control is high.

H5c (i): Skill discretion will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the

relationship will be stronger when skill discretion is low than when skill discretion is high.

H5c (ii): Skill discretion will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when skill discretion is low than when skill discretion is high.

H5d (i): Decision authority will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when decision authority is low than when decision authority is high.

H5d (ii): Decision authority will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when decision authority is low than when decision authority is high.

I also predicted that there would be longitudinal moderation effects of job control on the relationships between job demands and the psychological strain dimensions. These hypotheses were as follow:

Longitudinal hypotheses

Hypothesis 6: Job control will moderate the relationship between job demands and psychological strain over time.

H6a (i): Timing control at Time 1 will moderate the positive relationships between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when timing control at Time 1 is low than timing control at Time 1 is high.

H6a (ii): Timing control at Time 1 will moderate the positive relationships between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when timing control at Time 1 is low than timing control at Time 1 is high.

H6b (i): Methods control at Time 1 will moderate the positive relationships between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when methods control at Time 1 is low than when methods control at Time 1 is high.

H6b (ii): Methods control at Time 1 will moderate the positive relationships between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when methods control at Time 1 is low than when methods control at Time 1 is high.

H6c (i): Skill discretion at Time 1 will moderate the positive relationships between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when skill discretion at Time 1 is low than when skill discretion a Time 1 is high.

H6c (ii): Skill discretion at Time 1 will moderate the positive relationships between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when skill discretion at Time 1 is low than when skill discretion a Time 1 is high.

H6d (i): Decision authority at Time 1 will moderate the positive relationships between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when decision authority at Time 1 is low than when decision authority at Time 1 is high.

H6d (ii): Decision authority at Time 1 will moderate the positive relationships between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when decision authority at Time 1 is low than when decision authority at Time 1 is high.

Social support

The proposed model also posits that social support will play a role in the relationship between work design and psychological strain. Social support refers to helpful functions performed for an individual by others such as supervisors and co-workers. These functions typically include socio-emotional aid, instrumental aid, informational aid and social integration. Social support is important because it has beneficial effects on well-being. In the current study, I distinguished between three sources of social support: perceived organisational support, supervisor support and co-worker support. Given empirical studies indicating that social support has both direct and moderating effects on psychological strain, I expected

that social support will have both direct and moderating effects on work design and its relationship with psychological strain.

Social support was expected to have a main effect in the relationship between job demands and psychological strain. One explanation for this proposed main effect is that support increases individuals' self-esteem, making them less susceptible to the impact of job demands in their environment or may practically help them resolve problems. Social support has been recognised as an important determinant of employees' health and well-being in organisations (Jain & Sinha, 2005). These effects occur because social support helps employees to realise their socio-emotional needs (e.g., affiliation, esteem, approval), and signals the availability of aid when needed (Kinnunen, et al., 2008). Social activity has a positive quality and conveys feelings of energy, enthusiasm, and general feelings of positive affect (Watson, 2000).

Most studies of social support at work consider co-workers and supervisors as the two major sources of support (Peeters & Le Blanc, 2001). In the present study, I added another source of support, namely perceived organisational support (POS). Organisational support theory (Eisenberger, et al., 1986) has proposed that employees develop a global belief concerning the extent to which an organisational values their contributions and cares about their well-being. Perceived organisational support has been recognised as an important determinant of employees' health and well-being in organisation (Jain & Sinha, 2005), and reduced psychological and behavioural reactions (e.g., strain) (Goerge, et al., 1993).

In light of the above literature, I assessed the direct effects of indicators of social support on the psychological strain dimensions. These hypotheses were examined cross-sectionally and longitudinally. More specifically, I derived the following hypotheses:

Cross-sectional hypotheses

Hypothesis 7: Social support will be negatively related to psychological strain at both Times 1 and 2.

H7a (i): POS will be negatively related to anxiety/depression at both Times 1 and 2.

H7a (ii): POS will be negatively related to social dysfunction at both Times 1 and 2

H7b (i): Supervisor support will be negatively related to anxiety/depression at both Times 1 and 2.

H7b (ii): Supervisor support will be negatively related to social dysfunction at both Times 1 and 2.

H7c (i): Co-worker support will be negatively related to anxiety/depression at both Times 1 and 2.

H7c (ii): Co-worker support will be negatively related to social dysfunction at both Times 1 and 2.

Longitudinal hypotheses

Hypothesis 8: Social support will be negatively related to psychological strain over time.

H8a (i): POS at Time 1 will be negatively related to anxiety/depression at Time 2.

H8a (ii): POS at Time 1 will be negatively related to social dysfunction at Time 2.

H8b (i): Supervisor support at Time 1 will be negatively related to anxiety/depression at Time 2.

H8b (ii): Supervisor support at Time 1 will be negatively related to social dysfunction at Time 2.

H8c (i): Co-worker support at Time 1 will be negatively related to anxiety/depression at Time 2.

H8c (ii): Co-worker support at Time 1 will be negatively related to social dysfunction at Time 2.

Social support was also hypothesised to be a moderator variable in the relationship between job demands and psychological strain. Social support reduces the impact of job demands on psychological strain. Having support from others was hypothesised to attenuate the correlation between job demands and strain, primarily because support may help individuals to cope with their job demands (Cooper, et al., 2001). Social support may prevent job demands from exerting their impact on psychological strain, that is it may buffer against the

adverse effects of stressors and work demands at work (Viswesvaran, Sanchez, & Fisher, 1999).

In the 1980s social support was added to the job demand-control model, resulting in the Job Demands-Control Support (JDCS) model (Johnson & Hall, 1988). The JDCS model predicts that control and social support buffer the negative impact of high demands on well-being (i.e. they interact with demands to reduce their negative impact). Johnson (1986) introduced the term “iso-strain” to refer to jobs with high job demands, low job control, and low social support, and showed that employees in high iso-strain jobs reported more heart disease, fatigue, and other health complaints. Drawing on Johnson’s (1986) research, Karasek and Theorell (1990) argued that social support may facilitate successful coping with high-strain jobs (high demand and low control), preventing or buffering the potentially harmful effects of these kinds of jobs. The corresponding buffer hypothesis states that social support protects against the negative impact of high strain (Pelfrene, et al., 2002).

Landsbergis, Schanall, Deitz, Friedman, and Pickering (1992) found that a lack of social support reduced job satisfaction for those jobs characterised by high job demands and high job decision latitude (i.e. active job). In both cross-sectional and longitudinal analyses, Parkes, Mendham, and Von Rabenau (1994) showed that elevated psychosomatic health scores were associated with high strain jobs (i.e. high job demands and low job decision latitude) under conditions of low levels of social support at work.

Sargent and Terry (2000) found that there was consistent evidence that as long as there are high levels of social support and job control, job demands has a positive impact on satisfaction and work performance and that social support mitigate against the negative effects of high strain on depersonalisation. For example, high levels of supervisor support moderate the negative impact of high strain jobs specifically for job satisfaction and depersonalisation (Sargent & Terry, 2000). Moreover, high levels of co-worker support moderate the impact of low levels of task control on depersonalisation (Sargent & Terry, 2000). Furthermore, Rhodes and Eisenberger (2002) noted that employees developed general views concerning the degree to which supervisors value their contributions and care about their

well-being (i.e., perceived supervisor support). This is because supervisors act as agents of the organisation, having responsibility for directing and evaluating subordinates' performance, and employees view their supervisor's favourable or unfavourable orientation toward them as indicative of the organisation's support (Rhodes & Eisenberger, 2002). Research indicates that when supervisors are supportive of subordinates, this treatment leads to favourable outcomes for the employee and the organisation such as reduced work stress and enhanced performance (Rhodes & Eisenberger, 2002; Shanock & Eisenberger, 2006).

Co-worker support can be defined as helping relationships regarding work-related matters (Price, 1997). The helping relationships refer to the co-worker cohesion which represents the extent to which employees are friendly and supportive to one another. If co-workers help another employee to finish a task, for example, they often concurrently give affective support in addition to direct aid. In doing this, the co-workers also confirm the other person's belongingness to the group. According to Frese and Zapf (1994), co-worker support will take the forms of emotional, instrumental and informational support which are important to protect an individual's health and well-being. Co-worker support has been found useful in helping the individual to buffer the feeling of strain. A study by Van Vegchel et al. (2004) showed that support from co-workers buffered the emotional exhaustion which resulted from high emotional demands.

Based on previous research and the above suggestions, I tested the following hypotheses:

Cross-sectional hypotheses

Hypothesis 9: Social support will moderate the positive relationship between job demands and psychological strain at both Times 1 and 2.

H9a (i): POS will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when POS is low than when POS is high.

H9a (ii): POS will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when POS is low than when POS is high.

- H9b (i): Supervisor support will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when supervisor support is low than when supervisor support is high.
- H9b (ii): Supervisor support will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when supervisor support is low than when supervisor support is high.
- H9c (i): Co-worker support will moderate the positive relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when co-worker support is low than when co-worker support is high.
- H9c (ii): Co-worker support will moderate the positive relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when co-worker support is low than when co-worker support is high.

In addition to the cross-sectional moderating hypotheses, I also expected that social support would moderate the relationships between job demands and the psychological strain components over time. More specifically, I tested the following hypotheses:

Longitudinal hypotheses

Hypothesis 10: Social support will moderate the positive relationship between job demands and psychological strain over time.

- H10a (i): POS at Time 1 will moderate the relationship between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when POS at Time 1 is low than when POS at Time 1 is high.
- H10a (ii): POS at Time 1 will moderate the relationship between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when POS at Time 1 is low than when POS at Time 1 is high.
- H10b (i): Supervisor support at Time 1 will moderate the relationship between job demands at Time 1 and anxiety/depression at Time 2,

such that the relationship will be stronger when supervisor support at Time 1 is low than when supervisor support at Time 1 is high.

H10b (ii): Supervisor support at Time 1 will moderate the relationship between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when supervisor support at Time 1 is low than when supervisor support at Time 1 is high.

H10c (i): Co-worker support at Time 1 will moderate the relationship between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when co-worker support at time 1 is low than when co-worker support at Time 1 is high.

H10c (ii): Co-worker support at Time 1 will moderate the relationship between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when co-worker support at Time 1 is low than when co-worker support at Time 1 is high.

Additionally, following the JDCS model, I predicted a three-way interaction between job demands, job control, and social support in both cross-sectional and longitudinal analyses. Specifically, I assessed the following hypotheses:

Cross-sectional hypotheses:

Hypothesis 11: Social support will moderate the effects of ‘high strain’ on the psychological strain dimensions at both Times 1 and 2.

H11a (i): POS will moderate the effects of high job demands and low levels of the job control dimensions on anxiety/depression at both Times 1 and 2.

H11a (ii): POS will moderate the effects of high job demands and low levels of the job control dimensions on social dysfunction at both Times 1 and 2.

H11b (i): Supervisor support will moderate the effects of high job demands and low levels of the job control dimensions on anxiety/depression at both Times 1 and 2.

H11b (ii): Supervisor support will moderate the effects of high job demands and low levels of the job control dimensions on social dysfunction at both Times 1 and 2.

H11c (i): Co-worker support will moderate the effects of high job demands and low levels of the job control dimensions on anxiety/depression at both Times 1 and 2.

H11c (ii): Co-worker support will moderate the effects of high job demands and low levels of the job control dimensions on social dysfunction at both Times 1 and 2.

Longitudinal hypotheses:

Hypothesis 12: Social support will moderate the effects of ‘high strain’ on the psychological strain dimensions over time.

H12a (i): POS at Time 1 will moderate the effects of high job demands and low levels of the job control dimensions at Time 1 on anxiety/depression at Time 2.

H12a (ii): POS at Time 1 will moderate the effects of high job demands and low levels of the job control dimensions at Time 1 on social dysfunction at Time 2.

H12b (i): Supervisor support at Time 1 will moderate the effects of high job demands and low levels of the job control dimensions at Time 1 on anxiety/depression at Time 2.

H12b (ii): Supervisor support at Time 1 will moderate the effects of high job demands and low levels of the job control dimensions at Time 1 on social dysfunction at Time 2.

H12c (i): Co-worker support at Time 1 will moderate the effects of high job demands and low levels of the job control dimensions at Time 1 on anxiety/depression at Time 2.

H12c (ii): Co-worker support at Time 1 will moderate the effects of high job demands and low levels of the job control dimensions at Time 1 on social dysfunction at Time 2.

Self-efficacy

I also explored the role of individual differences in self-efficacy in the relationship between work design and psychological strain. Previous research has suggested that there is no “ideal” level of either job demands or job control that fits all individuals equally (Xie, 1996). Individuals prefer different levels of

environmental demands due to variations in their education and job tenure (Schuler, 1980), perceptions of the fit between people's abilities and their job requirements (Abdel-Halim, 1981), and their levels of self-esteem (Ganster & Schaubroeck, 1991). Self-efficacy serves as a moderator of job design-psychological strain relationships because it relates to a perception of control over the stressors (Bandura & Locke, 2003; Schaubroeck & Merritt, 1997) and the ability to perform tasks (Kurbanoglu, 2003). Self-efficacy is critical because it affects an individual's ability and willingness to exercise control (Litt, 1988). Control may benefit only those who are confident that they can use it and that it will be effective. People with high self-efficacy, having confidence in their ability to exercise control, should have better behavioural and psychological outcomes in high demands, high control situations than do people with low self-efficacy (Litt, 1988). It is clear that self-efficacy can influence cognition and help the individual to persevere in a stressful situation.

Another way that self-efficacy may impact stressor-strain relationships is by coping (Jex, et al., 2001). It has been suggested that those who are confident in their ability to carry out their job tasks are more likely to use effective ways of coping with workplace stressors (Keoske, Kirk, & Keoske, 1993; Kinicki & Latack, 1990). Jex et al. (2001) found that high self-efficacy individuals might use coping methods that prevent stressors from occurring in the first place. Furthermore, Schaubroeck and Merritt (1997) showed that self-efficacy was a moderator of the interaction between job demands and control predicting blood pressure.

Self-efficacy has also been found to have a direct effect on employee well-being, with studies reporting that it predicts depression and life satisfaction (Karademas, 2006), well-being (Kuijer & de Ridder, 2003), and job satisfaction (Judge & Bono, 2001). Liu, Siu, and Cooper (2005) reported that managerial self-efficacy was positively related to job satisfaction and negatively related to physical strain and psychological strain in the People's Republic of China.

It is argued that self-efficacy beliefs have direct effects on psychological strain and moderating effects on the job demands-strain relationships. Based on the literature, I expected that self-efficacy would have a direct effect on psychological

strain while also moderating the relationships between job demands and psychological strain. These hypotheses were tested cross-sectionally and longitudinally. More specifically, I tested the following hypotheses:

Cross-sectional main effect hypotheses

Hypothesis 13: Self-efficacy will be negatively related to psychological strain at both Times 1 and 2.

H13a: Self-efficacy will be negatively related to anxiety/depression at both Times 1 and 2.

H13a: Self-efficacy will be negatively related to social dysfunction at both Times 1 and 2.

Longitudinal main effects hypotheses

Hypothesis 14: Self-efficacy will be negatively related to psychological strain over time.

H14a: Self-efficacy at Time 1 will be negatively related to anxiety/depression at Time 2.

H14b: Self-efficacy at Time 1 will be negatively related to social dysfunction at Time 2.

Cross-sectional moderated effect hypotheses

Hypothesis 15: Self-efficacy will moderate the relationship between overall job demands and psychological strain at both Times 1 and 2.

H15a: Self-efficacy will moderate the relationship between job demands and anxiety/depression at both Times 1 and 2, such that the relationship will be stronger when self-efficacy is lower.

H15b: Self-efficacy will moderate the relationship between job demands and social dysfunction at both Times 1 and 2, such that the relationship will be stronger when self-efficacy is lower.

Longitudinal moderated effects hypotheses

Hypothesis 16: Self-efficacy will moderate the relationship between job demands and psychological strain over time.

H16a: Self-efficacy at Time 1 will moderate the relationship between job demands at Time 1 and anxiety/depression at Time 2, such that the relationship will be stronger when self-efficacy at Time 1 is lower.

H16b: Self-efficacy at Time 1 will moderate the relationship between job demands at Time 1 and social dysfunction at Time 2, such that the relationship will be stronger when self-efficacy at Time 1 is lower.

Outcome variables

In this study, the outcomes of psychological strain refer to the reactions of employees to psychological strain. The outcomes of psychological strain in this study were job satisfaction, affective commitment, turnover intentions, and job performance. As discussed in Chapter 2, *psychological strain* is conceptualised as a psychological reaction to a stressor that includes anxiety/depression and social dysfunction (Beehr, 1995). Warr (2002) stated that a great deal of research has examined feelings of strain arising from certain job features. Strain is often measured in terms of generalised distress, combining the two negative forms of well-being - anxiety and depression (Warr, 2002). French, Caplan and Harrison (1982) in the person-environment (P-E) fit model stated strain results from the mismatch between the person and environment on dimensions important to the well-being of the individual. French et al. (1982) explained the relationship between person and environment misfit and strain as a U-shaped curve. Strain will be minimal when optimal levels of environmental demands are reached. When the demands are too little or too great, strain increases.

In the present study, I expected that psychological strain would be directly related to job satisfaction, affective commitment, turnover intentions, and job performance.

Job satisfaction

Job satisfaction is defined as the extent to which a worker feels positively or negatively about his or her job (Odom, Boxx, & Dunn, 1990). In the current study, I expect that work design would be related to psychological strain, which in turn, would be related to job satisfaction among technical workers in Malaysia. Karasek (1979) and Xie (1996) found that job demands were negatively related to job satisfaction. Munro et al. (1998) established job strain (high demand and low control) as a significant predictor of both job satisfaction and mental health in a

sample of psychiatric nurses. Karsh et al. (2005) found that job and organisational factors predicted job satisfaction. In addition, studies have found significant negative relationships between psychological strain (e.g., anxiety) and job satisfaction (Parmar, 2001).

In this study, I expected that the feeling of psychological strain (i.e., anxiety/depression and social dysfunction) among employees would be negatively affect job satisfaction. In light of the above, I tested the following hypotheses:

Cross-sectional hypotheses

Hypothesis 17: Psychological strain will be negatively related to job satisfaction at both Times 1 and 2.

H17a: Anxiety/depression will be negatively related to job satisfaction at both Times 1 and 2.

H17b: Social dysfunction will be negatively related to job satisfaction at both Times 1 and 2.

In addition to the above hypotheses, I also expected longitudinal direct effects of the psychological strain components on job satisfaction. I predicted that the psychological strain components at Time 1 would be significantly negatively related to job satisfaction at Time 2. More specifically, I tested the following hypotheses:

Longitudinal hypotheses

Hypothesis 18: Psychological strain will be negatively related to job satisfaction over time.

H18a: Anxiety/depression at Time 1 will be negatively related to job satisfaction at Time 2.

H18b: Social dysfunction at Time 1 will be negatively related to job satisfaction at Time 2.

Conventional wisdom suggests that job satisfaction should lead to higher job performance (Spector, 1997). Spector (1997) stated that a happy employee should be a productive employee. People who are happy with their jobs might be more motivated, work harder, and therefore perform better (Spector, 1997). Social-cognitive theories (Ajzen, 1991) predict that attitudes toward the job (e.g., job satisfaction) would influence behaviours on the job (e.g., job performance), and

this prediction has been supported by a recent meta-analysis that synthesised the data of 16 longitudinal studies of job satisfaction-job performance relationship (Ricketta, 2008). On the basis of social exchange theory, researchers often expect employees who are satisfied with their jobs to perform better in these jobs (e.g., Fisher, 2003). Meta-analyses of the relationship between job satisfaction and job performance have reported a wide range results (i.e. $r = 0.14$ to 0.31 , Iaffaldano & Muchinsky, 1985; Judge, Thoresen, & Bono, 2001; Judge, Thoresen, Bono, & Patton, 2001). The most recent meta-analysis by Judge, Thoresen, Bono, and Patton (2001) reporting a moderate relationship ($r = 0.30$) between overall job satisfaction and overall job performance. Thus, in this study, I tested the following hypotheses:

Cross-sectional hypothesis

Hypothesis 19: Job satisfaction will be positively related to job performance at both Times 1 and 2.

Longitudinal hypothesis

Hypothesis 20: Job satisfaction at Time 1 will be positively related to job performance at Time 2.

Affective commitment

Organisational commitment has emerged as a central concept in the study of work-related attitudes and behaviour (Allen & Meyer, 1990). In general terms the concept can be defined as a psychological link between employee and his or her organisation. Most modern theoretical approaches share the assumption that the affective dimension represents one of the basic components of the organisational commitment constructs (Schmidt, 2007). Affective commitment refers to the identification with, involvement in, and emotional attachment to the organisation (Schmidt, 2007). Job design characteristics such as autonomy exhibit the strongest positive relation to affective commitment (Schmidt, 2007). Meyer, Stanley, Herscovitch, and Topolnytsky (2002) reported a statistically significant correlation between affective commitment and various indicators of strain. In addition, Meyer et al. (2002) also stressed the need for paying more attention to strain consequences of commitment. Based on this argument, I tested cross-sectionally and longitudinally the following hypotheses:

Cross-sectional hypotheses

Hypothesis 21: Psychological strain will be negatively related to affective commitment at both Times 1 and 2.

H21a: Anxiety/depression will be negatively related to affective commitment at both Times 1 and 2.

H21b: Social dysfunction will be negatively related to affective commitment at both Times 1 and 2.

Longitudinal hypotheses

Hypothesis 22: Psychological strain will be negatively related to affective commitment over time.

H22a: Anxiety/depression at Time 1 will be negatively related to affective commitment at Time 2.

H22b: Social dysfunction at Time 1 will be negatively related to affective commitment at Time 2.

Affective commitment has also been found to be positively related to a variety of behavioural criterion variables (Carmeli & Weisberg, 2006). For example, affective commitment yielded significant standardised beta weights with helping others and performance (Meyer, Allen, & Smith, 1993). Meyer and Allen (1997) also stated that employees with strong affective commitment to the organisation work harder at their jobs and perform better than those with weak commitment. For example, affective commitment has been positively correlated with various self-report measures of work performance (Bycio, Hackett, & Allen, 1995). Furthermore, employees with strong affective commitment appear much more willing to engage in organisational citizenship behaviour than those with weak affective commitment (Meyer & Allen, 1997). Thus, I developed the following hypothesis:

Cross-sectional hypothesis

Hypothesis 23: Affective commitment will be positively related to job performance at both Times 1 and 2.

I also expected a longitudinal direct effect of affective commitment on job performance over time. I predicted high levels of affective commitment at Time 1 would increase the levels of job performance at Time 2 among respondents. More specifically, I tested the following hypothesis.

Longitudinal hypothesis

Hypothesis 24: Affective commitment at Time 1 will be positively related to job performance at Time 2.

Turnover intentions

Turnover intentions refers to the subjective estimation of an individual regarding the probability that she or he will be leaving the organisation she or he works for in the near future (Mobley, et al., 1978). Previous research has shown that stressors and their resulting strains have a negative impact on the individual and deleterious effects on the organisation (Cropanzano, Kacmar, & Bozeman, 1995; DeFrank & Ivancevich, 1998). The higher an individual's strain level, the higher their turnover intentions (Parasuraman, 1982). Feelings of strain have been identified as major contributors to voluntary turnover and have ultimately been blamed for the loss of employees (Jex, 1998).

In this study, I expected that psychological strain (i.e. anxiety/depression and social dysfunction) would affect turnover intentions among employees. Specifically, I tested the following hypotheses:

Cross-sectional hypotheses

Hypothesis 25: Psychological strain will be positively related to turnover intentions at both Times 1 and 2.

H25a: Anxiety/depression will be positively related to turnover intentions at both Times 1 and 2.

H25b: Social dysfunction will be positively related to turnover intentions at both Times 1 and 2

Additionally, I also examined the longitudinal direct effect of psychological strain on turnover intentions. Specifically, I tested the following hypotheses:

Longitudinal hypotheses

Hypothesis 26: Psychological strain will be positively related to turnover intentions over time.

H26a: Anxiety/depression at Time 1 will be positively related to turnover intentions at Time 2.

H26b: Social dysfunction at Time 1 will be positively related to turnover intentions at Time 2.

Turnover intentions were also expected to have negative relations with job performance. Carmeli & Weisberg (2006) argued that employees demonstrating higher work performance will be more tied and committed to the organisation since employers will be willing to compensate and retain the more productive employees. Therefore, both parties will prefer to continue their relationship, since mutual benefit and exchange optimization exists. This will decrease the intentions of employees with higher job performance to leave the organisation (Carmeli & Weisberg, 2006). Moreover, empirical studies have also explored the relationships among contextual performance (i.e. OCBs) and turnover intentions, and actual turnover intentions. For instance, MacKenzie, Podsakoff, and Ahearne (1998) found a negative link between OCBs and turnover intentions. Based on the above, I derived the following hypotheses:

Cross-sectional hypothesis

Hypothesis 27: Turnover intentions will be negatively related to job performance at both Times 1 and 2.

Longitudinal hypothesis

Hypothesis 28: Turnover intentions at Time 1 will be negatively related to job performance at Time 2.

Job performance

There is some evidence linking strain to performance. For example, Wright and Bonett (1997) found that emotional exhaustion at Time 1 predicted job performance at Time 2. Wright and Cropanzano (1998) also showed a negative relationship between emotional exhaustion and job performance. In a similar vein, Cropanzano et al. (2003) showed that emotional exhaustion predicted job performance. In this study, I expected that feelings of psychological strain among employees would predict job performance. Specifically, I hypothesised the following:

Cross-sectional hypotheses

Hypothesis 29: Psychological strain will be negatively related to job performance at both Times 1 and 2.

H29a: Anxiety/depression will be negatively related to job performance at both Times 1 and 2.

H29b: Social dysfunction will be negatively related to job performance at both Times 1 and 2.

In addition, I tested the longitudinal direct effects of psychological strain on job performance. I expected that high levels of psychological strain at Time 1 would relate to reduce job performance at Time 2. Specifically, I assessed the following hypotheses:

Longitudinal hypotheses

Hypothesis 30: Psychological strain will be negatively related to job performance over time.

H30a: Anxiety/depression at Time 1 will be negatively related to job performance at Time 2.

H30b: Social dysfunction at Time 1 will be negatively related to job performance at Time 2.

Mediation Hypotheses

Consistent with the theoretical model in Figure 3.1 (see p.50), I proposed two mediational hypotheses in this study. The first mediational hypothesis examined from the paths of job demands and job control to work attitude variables (i.e. job satisfaction, affective commitment, and turnover intentions) through psychological strain (i.e. anxiety/depression and social dysfunction) as a mediator. The second mediational hypothesis examined the paths of psychological strain to job performance through job satisfaction, affective commitment, and turnover intentions as a set of mediators. It is of particular interest to investigate these mediation effects for the purpose of an intervention strategy. A variable is considered as a mediator when it creates the indirect effect through which the focal independent variable is able to influence the criterion variable of interest

(Baron & Kenny, 1986). The mediator variables transmit some of the causal effects of prior variables onto subsequent variables (Kline, 2005).

Mediating effects of psychological strain

In the first part of my mediational model, I expected that psychological strain would transmit the causal effects of job demands, timing control, methods control, skill discretion and decision authority on criterion variables (i.e. job satisfaction, affective commitment, job performance, and turnover intentions). Figure 3.2 presents the mediating effects of psychological strain in the relationships between work design variables and the criterion variables.

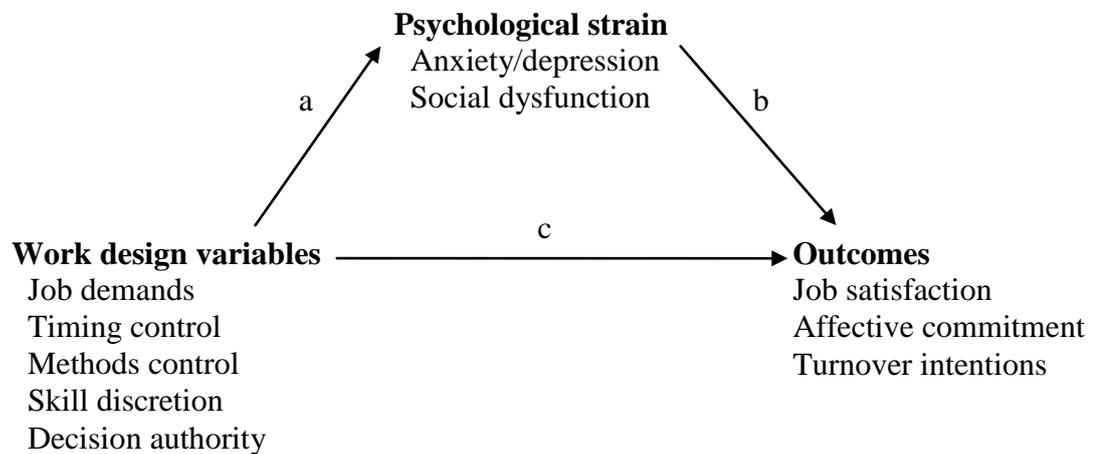


Figure 3.2. Psychological strain as a mediator

Although most studies have found a link between work design (i.e. job demands and job control) and employee strain, relatively few studies have examined how work design affects work outcomes (Jex, 1998). A practical reason that studies have commonly found a weak or nonexistent relationship between work design and work outcomes may be that intervening variables linking work design and work outcomes have not been taken into account (Lang, Thomas, Bliese, & Adler, 2007). For example, employee strain might be a mediating variable in the sense that work design negatively influence employee strain, and strain, in turn, influences job satisfaction, affective commitment and turnover intentions. Those studies that have examined the mediating effect of strain underscore the importance of considering its role as a mediator. Schaubroeck, Cotton, and

Jennings (1989) propose that work stressors (e.g., job demands) influence job attitudes (e.g., job satisfaction, affective commitment, and turnover intentions) indirectly through their effects on job strain. In particular, work stressors are positively related to strain, strain negatively impacts job satisfaction, affective commitment and positively influence turnover intentions (Podsakoff, et al., 2007). These relationships are consistent with the idea that high job demands and low job control are stressors that tend to evoke negative emotions and attitudes because people tend to appraise work stressors as potentially threatening of their personal growth and goal attainment (Podsakoff, et al., 2007). Work stressors (e.g., job demands) result in decreases in cognitive energy, confidence, and task persistence and these signs of psychological strain affect job attitudes (Lang, et al., 2007).

Work design variables such as job demands, timing control, methods control, skill discretion, and decision authority may affect psychological strain among technical workers in Malaysia, which in turn influence their job satisfaction, affective commitment, and turnover intentions. The first group of mediation hypotheses was:

Cross-sectional hypotheses

Hypothesis 31: Psychological strain will mediate the relationship between work design variables and outcome variables at both Times 1 and 2.

H31a: Anxiety/depression will mediate the relationships between work design (job demands, timing control, methods control, skill discretion, and decision authority) and job satisfaction, affective commitment, and turnover intentions at both Times 1 and 2.

H31b: Social dysfunction will mediate the relationships between work design (job demands, timing control, methods control, skill discretion, and decision authority) and job satisfaction, affective commitment, and turnover intentions at both Times 1 and 2.

Additionally, I also tested the longitudinal mediation effects of the dimensions of psychological strain on the relationships between work design variables and work attitudes variables. Specifically, I examined the following hypotheses:

Longitudinal hypotheses

Hypothesis 32: Psychological strain will mediate the relationship between work design variables and outcome variables over time.

H32a: Anxiety/depression at Time 2 will mediate the relationships between work design (job demands, timing control, methods control, skill discretion, and decision authority) at Time 1 and job satisfaction, affective commitment, and turnover intentions at Time 2.

H32b: Social dysfunction at Time 2 will mediate the relationships between work design (job demands, timing control, methods control, skill discretion, and decision authority) at Time 1 and job satisfaction, affective commitment, and turnover intentions at Time 2.

Mediating effects of job satisfaction, affective commitment, and turnover intentions

The third part of the theoretical model in Figure 3.1 (see p.50) posits job satisfaction, affective commitment, and turnover intentions as mediators that transmit the causal effect of psychological strain on job performance. As stated by Morgeson and Campion (2003), a key conceptual question in work design concerns the underlying psychological mechanisms through which work design influences affective and behavioural outcomes. According to Hackman and Lawler (1971), jobs must allow workers to feel responsible for meaningful and identifiable parts of the work, provide outcomes that are intrinsically meaningful, and provide feedback about performance success. Hackman and Oldham (1976) labelled these as critical psychological states and suggested they mediate between characteristics of the work and outcomes. Thus, changes in work design influence affective and behavioural outcomes because they alter these critical psychological states. However, there has been only mixed support for the intervening role played by the psychological states (Fried & Ferris, 1987; Johns, et al., 1992). Parker and Wall (2001) argued that the nature of the mechanisms underlying the effects of work design have been neglected by researchers.

Jex (1998) argued that most types of stress do not result in immediate roadblocks to job performance, but first negatively affect important antecedents of job performance. In the current study, I proposed that job satisfaction, affective commitment, and turnover intentions would mediate the relationship between

psychological strain and job performance. Figure 3.3 presents the mediating effects of job satisfaction, affective commitment, and turnover intentions.

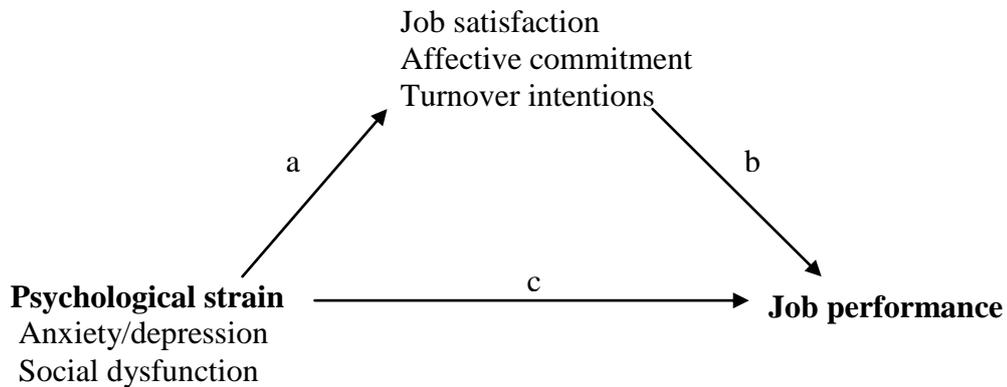


Figure 3.3. Job satisfaction, affective commitment and turnover intentions as mediators.

Psychological strain is a consequence of work design variables such as job demands and job control. Furthermore, psychological strain is expected to be associated with job satisfaction, affective commitment and turnover intentions. These outcomes of psychological strain are also expected to predict job performance. Hence, feelings of strain among employees lead to decreased job satisfaction and affective commitment, and increase turnover intentions, which in turn will reduce job performance. The mediated model tested in this study follows this logic. Thus, the second group of mediation hypotheses was:

Cross-sectional hypotheses

- H33a(i): Job satisfaction will mediate the relationship between anxiety/depression and job performance at both Times 1 and 2.
- H33a(ii): Job satisfaction will mediate the relationship between social dysfunction) and job performance at both Times 1 and 2.
- H33b(i): Affective commitment will mediate the relationship between anxiety/depression and job performance at both Times 1 and 2.
- H33b(ii): Affective commitment will mediate the relationship between social dysfunction) and job performance at both Times 1 and 2.
- H33c(i): Turnover intentions will mediate the relationship between anxiety/depression and job performance at both Times 1 and 2 .

H33c(ii): Turnover intentions will mediate the relationship between social dysfunction) and job performance at both Times 1 and 2.

I also tested the longitudinal mediation effects of job satisfaction, affective commitment, and turnover intentions on the relationships between psychological strain and job performance. The hypotheses were as follow:

Longitudinal hypotheses

H34a(i): Job satisfaction at Time 2 will mediate the relationship between anxiety/depression at Time 1 and job performance at Time 2.

H34a(ii): Job satisfaction at Time 2 will mediate the relationship between social dysfunction at Time 1 and job performance at Time 2.

H34b(i): Affective commitment at Time 2 will mediate the relationship between anxiety/depression at Time 1 and job performance at Time 2.

H34b(ii): Affective commitment at Time 2 will mediate the relationship between social dysfunction at Time 1 and job performance at Time 2.

H34c(i): Turnover intentions at Time 2 will mediate the relationship between anxiety/depression at Time 1 and job performance at Time 2.

H34c(ii): Turnover intentions at Time 2 will mediate the relationship between social dysfunction at Time 1 and job performance at Time 2.

Chapter Summary

This chapter has discussed the theoretical model and hypotheses developed for this study. The theoretical model builds upon the JD-R model suggests that work design is related to psychological strain (i.e. anxiety/depression and social dysfunction). Work design refers to psychosocial work characteristics such as job demands and job resources (i.e. job control, social support, and self-efficacy). Furthermore, my proposed model incorporates the moderating role played by job control, individual differences (i.e. self-efficacy), and social characteristics (i.e. social support) in the relationships between job demands and psychological strain. In addition, I incorporated two sets of mediation effects in the proposed model. Firstly, the mediation effect of psychological strain (i.e. anxiety/depression and social dysfunction) in the relationship between work design and various outcome of strain, i.e. job satisfaction, affective commitment, and turnover intentions.

Secondly, the mediation effect of the job satisfaction affective commitment, and turnover intentions in the relationship between psychological strain and job performance. I also tested the longitudinal hypotheses to examine the possible causal relations between variables. In the next chapter, I discuss the research methodology used in this study.

CHAPTER 4

RESEARCH METHODOLOGY

Chapter Overview

This chapter provides an overview of the research methodology used in the present research, including the research design, sampling procedures, sample size, measurement and instrument development, pilot sampling, testing and instrument revision, administration of the survey, forms of data analysis, and ethical considerations.

Research Design

Research design refers to the overall plan or structure used to conduct the entire study (Shaughnessy, Zechmeister & Zechmeister, 2006). As discussed earlier, the present study investigated the impact of work design on psychological strain and, subsequently, the effects of psychological strain on job satisfaction, affective commitment, turnover intentions, and job performance. I considered a survey approach the most appropriate method for this study because it is suitable for the type of information that I gathered (i.e., perceptions). I used the self-report mail survey, which is one of the most common types of quantitative research approaches (Shaughnessy & Zechmeister, 1997).

I implemented a longitudinal panel design in this study to assess possible causal relationships between the variables of the study. Longitudinal research refers to the analysis of data collected at different times (Shaughnessy, et al., 2006). All the variables were measured using the same questionnaire at two time points less than six months apart. Time 2 data were collected roughly six months later, which I considered adequate to enable clear identification of the potential causal relationships between the variables.

Organisational Context

The study was carried out in a large telecommunications organisation in Malaysia, Telekom Malaysia Berhad. Telekom Malaysia Berhad (TM) was incorporated on

12 October 1984. The principal activities of the company are the establishment, maintenance and provision of telecommunication and related services under the licence issued by the Malaysian Ministry of Energy, Water and Communications. It is a leading regional information and communications group, offers a comprehensive range of communication services and solutions in fixed-line, mobile, data and broadband. TM emphasises on continuing customer service quality enhancements and innovations. Currently, with investments and operations in 13 countries around Asia and globally, TM is focused on sustainable growth in both the local and international markets.

Technical workers are one of the core groups of people that make up Telekom Malaysia Berhad. Technical workers are a crucial human resource of Telecom Malaysia in order to accomplish their vision to provide an excellent facility of the telecommunication industry in Malaysia. I used data from a survey of technical workers in Telecom Malaysia because their jobs involve a high level skill. At the same time, the demands for highly skilled professional workers are likely to increase (e.g. technical workers) to make the technologies flexible in practice (Schoenberger, 1988).

Respondents, Sample Size and Administration Strategy

Kelloway (1998) suggested a sample size of at least 200 observations to be an appropriate minimum for survey research. Boomsma (1983) recommended a sample size of approximately 400 observations for models of moderate complexity. Schumacker and Lomax (1996) suggested that one can determine the appropriate sample size by using rule of thumb of 10 to 20 participants per variable.

Participants for this study were technical workers at nineteen branches of Telecom Malaysia. In order to ensure that every technical worker in the population frame had an equal chance of being selected for the sample, I distributed the questionnaire to all technical workers in the target population through internal mail. At the time the data collection commenced, there were about 1100 technical workers in the nineteen branches of Telecom Malaysia (see Table 4.1, p.90). A questionnaire (see Appendix B) was sent out to 1100 technical workers from

nineteen branches of Telecom Malaysia with a cover letter from the researcher. A stamped envelope addressed to the researcher was also included with each questionnaire for ease of return. These letters emphasised the importance of completing the survey and the confidentiality of the data. The cover letter also instructed the employees to return the questionnaire directly to the researcher or to their supervisors in the enclosed pre-stamped, pre-addressed envelope. The employees were asked to complete and return the survey within two weeks.

To maximise the response rate at both Time 1 and Time 2, a reminder notice with another copy of the survey enclosed was sent to employees five days after the initial distribution (Dillman, 2000). Because this was a longitudinal study, and the data were collected at two time points, the questionnaire was numbered with serial numbers for recording purposes. The serial number was matched to a list of participants. The list of names of potential participants was provided by the HR manager of Telecom Malaysia. The second survey was only posted to the technical workers who participated at Time 1.

The first stage of data collection started in December 2006. A total of 452 of the 1100 questionnaires were returned, giving a 41% rate of return. I dropped nine cases because they had too many missing values, where the respondents did not answer the items relating to job satisfaction, affective commitment, turnover intentions, and job performance. The remaining 443 responses became the sampling frame for the second stage of the data collection. The second wave of data collection was carried out six months later in June 2007. A total of 26 of the participants had either retired or transferred to other organisations by the time of the second wave of my data collection, resulting in a final sampling frame for Time 2 of 417 participants. A total of 253 participants completed the Time 2 questionnaire, which represented a 60.7% response rate among the 417 participants. After deleting the outliers, respondents at Time 1 and Time 2 were 429 and 245, respectively.

Table 4.1. Number of respondents for each branch of Telecom Malaysia

Branch	Questionnaire distributed (Time 1)	Number of respondents (Time 1)	Response rate (%) (Time 1)	Number of respondents (Time 2)	Response rate (%) (Time 2)
Batu Pahat	179	56	31.3	27	48.2
Kota Tinggi	27	4	14.8	4	100.0
Kluang	135	30	22.2	16	53.3
Mersing	24	3	12.5	3	100.0
Muar	104	7	6.7	7	100.0
Segamat	90	34	37.8	21	61.7
Johor Bahru	83	70	84.3	29	41.4
Pelangi	65	20	30.8	9	45.0
Pandan	85	48	56.5	27	56.3
Permas Jaya	15	8	53.3	7	87.5
Larkin	34	8	23.5	8	100.0
Tampoi	42	34	81.0	28	82.4
Skudai	55	15	27.3	9	60.0
Pasir Gudang	19	2	10.5	1	50.0
Kulai	19	19	100.0	12	63.2
Senai	23	23	100.0	13	56.5
Pontian	46	45	97.8	21	46.7
Johor Selatan	20	13	44.8	6	46.2
Johor Timur	29	13	44.8	5	38.5
TOTAL	1100	452	41.0	253	60.0

Sample Demographics

Table 4.2 summarises the demographic characteristics of the study sample for Time 1 and Time 2. At Time 1, 84.6% of the respondents were male and 15.4% were female. Their ages ranged from 20 to 55 years with a mean age of 45.7. The mean duration of tenure in the organisation was 13.4 years. With respect to their racial identity, 93.9% were Malay, 5.6% were Indian and 0.5% were Chinese. A majority of them were married 93.9% while only 4% were single and 2.1% were widowed or divorced. In terms of education level, 81.8 % had a Malaysian Certificate of Education (SPM/STPM); 16.1% had a diploma; 1.6% had university

degree; and 0.5% had a master's degree. 41.7% of the respondents were technicians, 33.1% were senior technicians, 18.9% were technical officer assistants, and 6.3% were technical officers.

Table 4.2. Demographic characteristics

Variable	Time 1 (n=429)			Time 2 (n=245)		
	Mean	SD	Range	Mean	SD	Range
Age (years)	45.69	6.74	20 – 55	46.61	6.72	20 - 55
Tenure (years)	13.41	8.36	0.50 – 30	12.76	8.93	0.50 – 31
	<i>f</i>	%		<i>f</i>	%	
Gender						
Male	363	84.6		195	79.6	
Female	66	15.4		50	20.4	
Race						
Malay	403	93.9		227	92.7	
Indian	24	5.6		17	6.9	
Chinese	2	0.5		1	0.4	
Marital Status						
Married	403	93.9		235	95.9	
Single	17	4.0		7	2.9	
Widow/Divorced	9	2.1		3	1.2	
Education level						
SPM/STPM	351	81.8		211	86.1	
Diploma	69	16.1		29	11.8	
Degree	7	1.6		5	2.0	
Master	2	0.5		0	0	
Position						
Technical Officer	27	6.3		15	6.1	
Technical Officer Assistant	81	18.9		36	14.7	
Senior Technician	142	33.1		111	45.3	
Technician	179	41.7		83	33.9	

f = frequency

Table 4.2 also presents the respondents' demographic profile for Time 2. Similar to Time 1, a majority of the respondents were male (79.6%) and only 20.4% were female. With respect to their racial identity 92.7% were Malay, 6.9% were Indian and 0.4% were Chinese. The average age was 46.61 years, ranging from 20 to 55 years. The average tenure in the position in the organisation was 12.76 years. 95.9% of the respondents were married, 2.9% were single and 1.2% were widowed or divorced. The majority of the respondents had a Malaysian Certificate of Education (SPM/STPM) (86.1%), diploma (11.8%), and university degree (2%). In terms of position in the organisation, senior technicians were the highest (45.3%), followed by the technicians (33.9%), technical officer assistants (14.7%), and technical officers (6.1%).

Instrument Development

Table 4.3 presents a summary of the variables that were used in this study, their sources and Cronbach's alpha coefficients for Times 1 and 2.

Table 4.3. The variables, sources of the scales and reliability analysis

Variable Name	Source	No of Items	Reliability	
			Time 1	Time 2
1. Attention demands	Wall et al. (1995)	4	0.73	0.71
2. Problem-solving demands	Wall et al. (1995)	5	0.79	0.75
3. Responsibility demands	Wall et al. (1995)	5	0.80	0.84
4. Quantitative demands	Van Yperen & Snijders (2000)	11	0.83	0.83
5. Timing control	Wall et al. (1995)	4	0.74	0.77
6. Methods control	Wall et al. (1995)	6	0.77	0.80
7. Skill discretion	Karasek (1985)	6	0.80	0.78
8. Decision authority	Karasek (1985)	3	0.80	0.80
9. POS	Eisenberger et al. (1997)	8	0.80	0.73
10. Supervisor support	O'Driscoll (2000)	4	0.89	0.88
11. Co-worker support	O'Driscoll (2000)	4	0.91	0.91
12. Self-efficacy	Riggs et al. (1994)	10	0.84	0.84
13. Psychological strain	Goldberg (1978)	12	0.74	0.74
14. Job Satisfaction	Warr et al. (1979)	15	0.92	0.90
15. Affective commitment	Allen & Meyer (1990)	8	0.79	0.77
16. Turnover intentions	Mobley et al. (1978)	3	0.85	0.94
17. OCBO	Williams & Anderson (1991)	7	0.80	0.78
18. OCBI	Williams & Anderson (1991)	7	0.81	0.82
19. In-role performance	Williams & Anderson (1991)	7	0.78	0.74

Note. POS = perceived organisational support; OCBO = organisational citizenship behaviour towards the organisation; and OCBI = Organisational citizenship behaviour towards individuals

I used a paper-based questionnaire as the instrument for the survey, translated into Malay (Appendix B), because the entire population speaks Malay. The English version of this questionnaire can be shown in Appendix A. All items intended to measure the variables in this study were adopted from previously validated instruments. I computed scale scores of the variables by averaging scores across their items for each participant.

Job demands

Based on theoretical considerations, I assessed job demands based on four dimensions, i.e. quantitative demands, attention demands, problem-solving demands, and responsibility demands. In order to measure these four dimensions of job demands, I reviewed several popular measures of job demands which have been used in the literature. Because no existing instrument covers all four of the above job demands, I used several scales from diverse researchers. The measures are as below:

Quantitative demands

I measured quantitative demands using the scale by Van Yperen and Snijders (2000). This scale consists of 11 items (refer Appendix A, items 25-35). A four-point response scale was used, with responses ranging from “never” to “always”. According to Van Yperen and Hagedoorn (2003), this scale had a high reliability (Cronbach’s alpha coefficient at 0.90). In the present study, the Cronbach’s alpha for this scale was 0.83 at both Times 1 and 2.

Attentions demands

I used the Wall, Jackson and Mullarkey (1995) scale to measure attention demands among the respondents. This scale contains four items (see Appendix A, items 1- 4). A five-point response scale was used, with responses ranging from “not at all” to “a great deal”. The Cronbach’s alpha for this scale was 0.73 at Time 1 and 0.71 at Time 2.

Problem-solving demands

I measured problem-solving demands using the Wall, Jackson, and Mullarkey (1995) scale. This scale consists of five items (see Appendix A, items 5-9). A five-point response scale was used, with responses ranging from “not at all” to “a

great deal". The Cronbach's alpha for this scale was 0.79 at Time 1 and 0.75 at Time 2.

Responsibility demands

I also used the Wall, Jackson, and Mullarkey (1995) scale to measure responsibility demands among the respondents. This scale consists of five items (see Appendix A, items 10-14). A five-point response scale was used, with responses ranging from "not at all" to "a great deal". The Cronbach's alpha for this scale was 0.80 at Time 1 and 0.84 at Time 2.

Job control

I measured job control based on four dimensions, i.e. skill discretion, decision authority, timing control, and method control. Because no existing instrument included all four dimensions, I used several scales from diverse researchers. The measures are as below:

Skill discretion

I used the Job Content Questionnaire (JCQ) (Karasek, 1985) to measure skill discretion. This scale consists of six items (see Appendix A, items 36-41). A six-point response scale was used, with responses ranging from "strongly disagree" to "strongly agree". The Cronbach's alpha for this scale was 0.80 at Time 1 and 0.78 at Time 2.

Decision authority

I also used the Job Content Questionnaire (JCQ) (Karasek, 1985) to measure decision authority. This scale consists of three items (see Appendix A, items 42-44). A six-point response scale was used, with responses ranging from "strongly disagree" to "strongly agree". The Cronbach's alpha for this scale was 0.80 at both times.

Timing control

I used the Wall et al. (1995) scale to measure timing control among the respondents. This scale consists of four items (see Appendix A, items 15-18). A five-response scale was used, with responses ranging from "not at all" to "great deal". The Cronbach's alpha was 0.74 at Time 1 and 0.77 at Time 2, respectively.

Method control

I also used the Wall et al. (1995) scale to measure method control among the respondents. This scale consists of six items (see Appendix A, items 19-24). A five-point response scale was used, with responses ranging from “not at all” to “great deal”. The Cronbach’s alpha for these scales were 0.77 at Time 1 and 0.80 at Time 2.

Psychological strain

After reviewing several measures of psychological strain which have been used in research on the Job Demands Control Support model, I chose the 12-item version of the General Health Questionnaire (GHQ-12) by Goldberg and Williams (1988) to measure the feeling of strain among technical workers. My decision was based on this measure having a high reliability in previous studies, ranging from 0.86 to 0.90, and wide use (e.g., Francis & Barling, 2005; Mansell, Brough, & Cole, 2006). This scale consists of six positively-worded items and six negatively-worded items. The items for GHQ-12 were designed to ask informants about their general level of happiness, experience of depressive and anxiety symptoms, and sleep disturbance. Its validity and reliability across cultures have been thoroughly assessed and demonstrated (Tait, French, & Hulse, 2003), and the measure has been broadly used with a range of working populations (Mansell, et al., 2006).

The respondents were asked to indicate the extent to which they have experienced the following situations over the last three months. The sample items are ‘Been able to concentrate on what you are doing?’, ‘Lost much sleep over worry?’ and ‘Been feeling unhappy or depressed?’ Every question represents a symptom of psychological disorder experienced by an individual. A six-point response scale was used, with responses ranging from 1 = ‘never’ to 6 = ‘all the time’. The use of a six-point response for the GHQ-12 has been shown to be efficacious in structural equation modeling (Kalliath, O’Driscoll, & Brough, 2004). High scores represent high levels of psychological strain. The internal reliabilities of this scale were 0.74 for Time 1 and Time 2.

Perceived organisational support

I used Eisenberger, Cummings, Armeli, and Lynch's (1997) short version of the Survey of Perceived Organisational Support (SPOS) to assess the extent to which employees perceived that their organisation valued their contributions and cared about their well-being. Prior studies surveying a variety of occupations and organisations have provided evidence for the high internal reliability and the unidimensional nature of this measure (e.g., Eisenberger, et al., 1986; Setton, Bennett, & Liden, 1996; Shore & Tetrick, 1991; Shore & Wayne, 1993; Wayne, Shore, & Liden, 1997). The SPOS contains eight items. Respondents indicated their extent of agreement with each statement using a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree). The Cronbach's alpha for this scale in the present sample was 0.80 at Time 1 and 0.73 at Time 2. The sample items are 'My organisation strongly considers my goals and values?' 'My organisation really cares about my well-being' and 'My organisation shows very little concern for me'.

Supervisor and co-worker support

I chose four-item scales developed by O'Driscoll (2000) to measure respondents' perceptions of the level of supervisor and co-worker support they received. The respondents were asked how often they get support from their supervisor or co-worker when they are having problems at work. The questions were "How often did you get support from the following people in terms of...":

- i. Helpful information or advice?
- ii. Sympathetic understanding and concern?
- iii. Clear and helpful feedback?
- iv. Practical assistance?

A six-point response scale was used, ranging from "1 = never" to "6 = all the time". All scales had high internal reliabilities: supervisor support (Cronbach's $\alpha = 0.89$ at Time 1 and 0.88 at Time 2) and co-worker support (Cronbach's $\alpha = 0.91$ at Time 1 and Time 2).

Self-efficacy

I used the Personal Efficacy Beliefs scale developed by Riggs, Warka, Babasa, Betancourt, and Hooker (1994) to measure self-efficacy. The Personal Efficacy Beliefs Scale consists of 10 items. A 7-point response scale was used, ranging from “strongly disagree” to “strongly agree”. According to Riggs et al. (1994), this scale had reliabilities ranging from 0.85 to 0.88. Schaubroeck, Lam, and Xie (2000) used this scale and found that it was suitable to measure self-efficacy among employees. The Cronbach’s alpha for this scale in the present sample was 0.84 at Time 1 and Time 2. It appears that this scale had a high internal reliability at both time points. The respondents were asked to indicate their ability to do the tasks required by their job with each of the following items. The sample items are ‘I have confidence in my ability to do my job’, ‘There are some tasks required by my job that I cannot do well’ and ‘When my performance is poor, it is due to my lack of ability’.

Job satisfaction

I employed a 15-item scale developed by Warr, Cook, and Wall (1979) to measure job satisfaction. This scale was designed to measure the satisfaction or dissatisfaction felt by participants in relation to various facets of work (e.g., physical conditions, management, salary, and job security). The scale attempts to measure the degree of satisfaction with intrinsic and extrinsic job components. Several researchers have used this scale to measure job satisfaction (e.g., Brough & Frame, 2004). Noblet (2003) found that the scale had a Cronbach’s alpha of 0.91. Mansell et al. (2006) found that alpha coefficients for the composite satisfaction measure ranged from .88 to .91. The present study showed that the Job Satisfaction Scale had a high internal reliability, with Cronbach’s alpha of 0.92 at Time 1 and 0.90 at Time 2.

The respondents were asked to indicate how satisfied or dissatisfied they were on a seven-point response scale, ranging from “very dissatisfied” to “very satisfied”. High scores represent a high-level of satisfaction. The sample items are ‘The physical work conditions’ and ‘The freedom to choose your own method of working’. I also included one item from Warr et al. (1979) to measure global job satisfaction to provide a cross-check on the overall satisfaction score created from

summing across the 15 items. The item is “Now, taking everything into consideration, how do you feel about your job as a whole?” The same seven-point response scale was used as above.

Affective commitment

I selected the Affective Commitment Scale by Allen and Meyer (1990) to measure affective commitment. Allen and Meyer (1990) found that this scale has a high reliability of 0.87. Likewise, Tremble, Payne, Finch, and Bullis (2003) found that this scale had uniform internal consistencies over a number of studies, with a median of 0.85. Researchers using the Affective Commitment Scale reported that it forms a single factor with high reliability (Meyer & Allen, 1997). The Cronbach’s alpha for this scale in the present sample was 0.79 at Time 1 and 0.77 at Time 2. Low scores represent a lack of affective commitment, while high scores represent high affective commitment. Seven response categories ranging from ‘strongly disagree’ to ‘strongly agree’ were used to measure the level of agreement with each statement. The respondents were asked to indicate their affective commitment with each of the items. The sample items are ‘I would be very happy to spend the rest of my career with my organisation’, ‘I enjoy discussing my organisation with people outside it’ and ‘I really feel as if my organisation’s problems are my own’.

Turnover intentions

After reviewing several measures, I chose three items from Mobley, Horner, and Hollingsworth’s (1978) scale to measure turnover intentions among technical workers. According to Carmeli and Weisberg (2006), this scale had good reliability (Cronbach’s alpha = 0.90). The Cronbach’s alpha for turnover intentions in this study was 0.85 at Time 1 and 0.94 at Time 2. The items are as follows:

- i. I think a lot about leaving this organisation.
- ii. I am actively searching for an alternative to this organisation.
- iii. As soon as it is possible, I will leave this organisation.

Responses were given on a seven response scale ranging from ‘strongly disagree’ to ‘strongly agree’ to measure the level of agreement with each statement.

Job performance

Job performance was divided into two categories, in-role performance and organisational citizenship behaviours. I employed Williams and Anderson's (1991) scales to measure citizenship behaviours and in-role performance among technical workers. These scales include seven organisational citizenship behaviours toward the organisation (OCBO), seven organisational citizenship behaviours towards individuals (OCBI), and seven items assessing in-role performance (IRP). Moreover, the Williams and Anderson's (1991) scale is the only one to distinguish between OCBI and OCBO. Williams and Anderson (1991) reported that the OCBO and OCBI factors correlated 0.43, the OCBO and IRP factor were correlated 0.47, and the OCB-I and IRP factors were correlated 0.48, suggesting that these factors reflect relatively distinct forms of behaviour.

Turnley, Bolino, Lester, and Bloodgood (2003) reported a confirmatory factor analysis of Williams and Anderson's (1991) scales. They noted that the three-factor model fit the data reasonably well and that each item loaded on its specified factor. Cronbach's alpha for in-role performance scale was 0.93, while Cronbach's alpha for OCBO and the OCBI scales were 0.83 and 0.88, respectively (Turnley, et al., 2003). In this study, I found that all the scales had an acceptable internal reliability: OCBO (Cronbach's $\alpha = 0.80$ at Time 1 and 0.78 at Time 2); OCBI (Cronbach's $\alpha = 0.81$ at Time 1 and 0.82 at Time 2); and IRP (Cronbach's $\alpha = 0.78$ at Time 1 and 0.74 at Time 2).

For all three variables, respondents were asked to indicate their agreement or disagreement with each item. In each case, responses were given on a seven-point response scale ranging from "strongly disagree" to "strongly agree", with a midpoint labelled "neither agree nor disagree". The sample items are 'Fulfils all the responsibilities specified in job description' (IRP), 'Attendance at work is above the norm' (OCBO), and 'Help others who have been absent' (OCBI)

Control variables

I also included five demographic variables as controls in this study. The variables were age, marital status, educational level, position, and work tenure. The control variables were included because previous research has shown a strong impact of

these variables on personal outcomes, e.g., turnover intentions (Griffeth, et al., 2000; Harris, James, & Boonthanom, 2005).

Pilot Sampling, Testing, and Instrument Revision

Because this study was conducted in a Malay-speaking context, all measures were translated from English to Malay by the researcher (see Appendix A and B). Then, to ensure transliteral equivalence of these measurement scales, the translated questionnaires were translated back into English by two independent researchers: one from the Faculty of Management and Human Resource Development at the University of Technology Malaysia and one from the Department of General and Applied Linguistics at the University of Waikato, both of whom were proficient in both English and Malay. The human resource manager of the organisation and the researcher also discussed and verified each translated questionnaire to ensure its clarity. A focus group involving the human resource manager and representatives from workers was conducted to review each item in the questionnaire to ensure its ability to be understood and its clarity.

A pilot study of the Malay version of the questionnaire was conducted before the distribution of the questionnaire to the target sample. The purpose of the pilot test was to evaluate the clarity and appropriateness of the questions contained in the instrument in Telecom Malaysia. The pilot study was conducted on a focus group consisting of 15 technical workers. The technical workers were asked to complete the questionnaire as well as to comment on item clarity, understanding, consistency and readability. In general, all technical workers felt that the questionnaire was clear and easy to understand. Although there was a slight concern about the length of the questionnaire, overall they felt that the 15 to 20 minutes needed to complete the questionnaire was reasonable. Based on this feedback, no changes were made to the questionnaire.

Method of Analysis

This section explains the methods of analysis used to address the research questions. The data analyses included data preparation, checking for outliers, normality check, reliability and validity check, confirmatory factor analysis,

descriptive statistics, correlations, hierarchical regression analysis, structural equation modeling, and longitudinal analysis.

Data preparation

I used the Statistical Package for Social Science (SPSS) 17.0 for Window to log in the data. I reverse scored the negatively worded items. I examined frequencies of all items to detect any data entry errors and missing responses. I found that nine cases had a lot of missing data where the respondents did not answer all the items in the criterion variables (e.g., psychological strain, job satisfaction, affective commitment and turnover intentions) and these were removed from the analysis.

I then proceeded to check for potential outliers. Outliers are extreme data points that may affect results of statistical tests. They potentially have significant effects on the indices of model fit, parameters estimates, and standard errors (West, Finch, & Curran, 1995). I performed the Mahalanobis distance test (D^2) using SPSS to assess multivariate outliers. The D^2 test is a common approach to detect multivariate outliers (Tabachnick & Fidell, 2001). D^2 values that are significant at a 5% level indicate outliers, while those significant at a 1% level indicate extreme outliers (Mullen, Milne, & Doney, 1995). In this study, I used a 1% level to identify any multivariate outliers (see Appendix D).

After I checked for multivariate outliers, I tested the normality of the data set using the Kolmogorov-Smirnov skewness and kurtosis statistics to test the normality of the data. If the values of skewness and kurtosis statistics fall inside the range of plus or minus three, the distribution is considered normal (Tabachnick & Fidell, 2001). The results from the assessment of multivariate outliers and normality are reported in Chapter 5.

Confirmatory factor analysis

I conducted confirmatory factor analysis (CFA) using AMOS 18 on all measures of the study. I ran a CFA for each of the measures: (a) job demands consisting of attention demands, problem-solving demands, responsibility demands and quantitative demands; (b) job control consisting of timing control, methods control, skill discretion and decision authority; (c) social support consisting of

perceived organisational support, supervisor support, and co-worker support; (d) GHQ-12; (e) self-efficacy; (f) job satisfaction; (g) affective commitment scale; (h) turnover intentions scale, and (i) job performance scales consisting of organisational citizenship behaviour towards the organisation (OCBO), organisation citizenship behaviours towards individual (OCBI), and in-role performance (IRP). The results of these CFA analyses are presented in Chapter 5.

Descriptive statistics and correlations

After I done the CFA analyses, I calculated the descriptive statistics to provide basic information on the nature of each variable in this study. Percentage, frequency, means, standard deviations were generated for all data via charts and tables to examine the variability of the data. I also conducted correlations analyses for each study variable to examine the pattern of relationships between study variables.

Hierarchical regression analysis

I used hierarchical regression analysis to investigate the main effect and moderation effect hypotheses. I tested the relationships between the predictors and the criteria by means of hierarchical regression analyses, conducted separately for each of the criterion variables. For moderation effects analysis, I applied hierarchical moderated regression analyses. Because the regression equations contain two- and three-way interactions, the main effect terms and higher order product terms may be highly correlated with one another. This may cause the problem of multicollinearity, which makes the regression coefficients unstable and difficult to interpret (Cohen & Cohen, 1983). I calculated the standardised scores for all predictors to mitigate the problem of multicollinearity.

The predictors were entered into the regression equation in four successive steps. In the first step, demographic variables were entered to control for possible confounding effects. In the second step, the predictor variables of job demands, job control, social support, and self efficacy were entered. In the next two steps, the interactions of interest were added (e.g., job demands x job control, job demands x social support, job demands x self efficacy, job demands x job control

x social support). Cross-product terms of the standardised scores were computed in order to test these interaction effects.

These analyses enabled me to explore the strength of the impact of those moderators on psychological strain. I used R^2 to measure the goodness of fit of the regression. A significant F value indicated that the variable(s) entered in that step made a significant incremental contribution to the prediction of outcome variables. I tested the significance for the set of variables by examining the increase in R^2 for the each step over and above the R^2 for previous steps (Cohen & Cohen, 1983), and I used the beta coefficients (β) to evaluate the contribution of each of the predictor variables. In order to understand the significant interaction better, I used the techniques suggested by Aiken & West (1991) to generate plots for each interaction.

Structural equation modeling

Following the recommendation by James and Brett (1984), I employ the structural equation modeling (SEM) approach to test mediation hypotheses. I performed SEM using the maximum likelihood method with AMOS 18 to test the structural mediation model. I chose SEM to test the structural model for several reasons. First, SEM has an advantage of providing global measures of fit for latent variable models (Brannick, 1995). Second, my research model comprised many paths. SEM provides estimations for a series of separate regression equations simultaneously (Hair et al., 1998). Third, SEM is also considered to be most appropriate for this study due to the interdependent nature of the research variables. Finally, the technique allows for the specification and testing of complex path models and is considered more rigorous and more flexible than multiple regressions to test mediation effects (Kelloway, 1998).

In the present study, I tested the fit of the hypothesised mediation models. If the model did not provide an acceptable fit to the data, I conducted re-specification of the model using modification indices (M.I.), referred to as ‘model trimming’. Model trimming is an important step in the elimination of non-significant paths. It is important to trim the insignificant paths to find the one or two most relevant paths in order to improve the structural model. After inspection of the

modification indices, I tested the fit of the final model. I used some common fit indexes, including the Chi-square (χ^2), the normed Chi-square (χ^2/df), the root mean square error of approximation (RMSEA), the root mean square residual (RMR), the comparative fit index (CFI), and the goodness-of-fit index (GFI).

The χ^2 value statistic is a goodness-of-fit measure that assesses the magnitude of the discrepancy between the sample (the observed) covariance matrix and the estimated (fitted) covariance matrix (Hu & Bentler, 1999). A large, statistically significant value relative to the degrees of freedom indicates poor model fit. The χ^2 value statistic is sensitive to sample size and with a large sample size may result in the rejection of the specified model (Hu & Bentler, 1999). The normed χ^2 measure is the ratio of the χ^2 value to its degrees of freedom (χ^2/df), where ratios in the range of 2.0 to 1.0 are indicative of an acceptable fit between the hypothetical model and the sample data (Byrne, 2001). Values between 1.0 and 5.0 are acceptable (Schumacker & Lomax, 1996).

The RMSEA is a measure of the discrepancy per degree of freedom for the model (Browne & Cudeck, 1993). Values of 0.05 or less indicate a good fit of the model to the data (Byrne, 2001) and values of 0.08 or less represent an acceptable fit (Byrne, 2001; Hu & Bentler, 1999). The RMR is a measure of the mean absolute value of the covariance residuals. Perfect model fit is indicated by $\text{RMR} = 0$. However, values of the RMR less than 0.10 are generally considered favourable (Kline, 2005). The CFI is a measure of the relative improvement in fit of the model compared to a baseline model. A rule of thumb for the CFI is that values greater than 0.90 indicate reasonably good fit and $\text{CFI} = 1.0$ indicates perfect fit (Hu & Bentler, 1999). The GFI is analogous to a squared multiple correlation (R^2) except that the GFI is kind of matrix proportion of explained variance (Kline, 2005). $\text{GFI} = 1.0$ indicates perfect model fit, $\text{GFI} > 0.90$ may indicate good fit, and values close to zero indicate very poor fit.

I tested the mediation effects by using the approach recommended by MacKinnon, Fairchild, and Fritz (2007). I checked the direct effect, indirect effect, and total effect statistics. I used 1000 bootstrap samples and bias-corrected confidence intervals (CIs) to determine the significance of the hypothesized mediation effects.

Longitudinal analysis

I performed longitudinal analysis in order to establish the possible causal relationship between the variables in the proposed model. The purpose of the longitudinal analysis was to explain the causal relation between predictor, moderator, mediator and criterion variables. I designed this two-wave panel study to provide more information about possible causal relations between variables in the model. I used hierarchical multiple regression to test the longitudinal main effects and moderation effects hypotheses. I also conducted SEM to test the longitudinal mediation hypotheses.

Longitudinal hierarchical regression

I used the time-effect method to assess the longitudinal direct and moderating effects hypotheses as recommended by Finkel (1995). Under this method, the criterion at Time 2 was regressed on the predictor variable at Time 1 (Cole & Maxwell, 2003). The reason behind the use of this approach is to examine whether there is a significant time effect of predictor variable on the criterion variable over a specified time period.

The predictors were entered into the regression equation in five successive steps. In the first step, Time 1 criterion scores were entered in the regression. Thus, initial levels of criterion variables have been controlled for. Such a design serves to strengthen the argument that predictor variables at Time 1 play a possible causal role in relation to criterion variables at Time 2 (Cohen & Cohen, 1983; Finkel, 1995). In the second step, demographic variables were entered to control for possible confounding effects. In the third step, the predictor variables of Time 1 job demands, Time 1 job control, Time 1 social support, and Time 1 self efficacy were entered. In the next two steps, the interactions of interest were added (e.g., Time 1 job demands x Time 1 job control, Time 1 job demands x Time 1 social support, Time 1 job demands x Time 1 self efficacy, Time 1 job demands x Time 1 job control x Time 1 social support). Cross-product interaction terms of the standardised scores were computed in order to test these interaction effects.

The time-effect method has been shown to minimize the potential for confounds of the effects of the component measures and also provide direct test of the

components relative to the criterion variable (Bergh & Fairbank, 2002). This method has also been shown to avoid the reliability concerns associated with change score method. It also minimize the potential for confounds of the effects of the component measures.

Longitudinal structural equation modeling

I used structural equation modeling (SEM) to examine the longitudinal mediation hypotheses in this study. Longitudinal mediation models permit the examination of several mediation questions that cannot be asked using cross-sectional mediation analysis, such as whether a mediated effect is stable over time. Longitudinal models also shed light on temporal-precedence or causal-ordering assumptions by quantifying mediation relations among variables over time (MacKinnon & Fairchild, 2009). In the current study, I employed the autoregressive model to test the longitudinal mediation hypotheses following the recommendation by Cole and Maxwell (2003) and MacKinnon (1994). In this approach, first, I estimated the effects of the predictor at Time 1 on the mediator at Time 2, controlling for the mediator at Time 1. Second, I estimated the effects of the mediator at Time 2 on the criterion at Time 2, controlling for the criterion at Time 1. I controlled the mediator at Time 1 and the criterion at Time 2 to provide more evidence for temporal ordering of the mediator and criterion variables.

Ethical Considerations

The Research and Ethics Committee of the Department of Psychology, University of Waikato granted ethical approval for this research. Approval from the Human Resource Manager of Telecom Malaysia was also obtained before the distribution of the questionnaires. Participation in this study was voluntary and I told the participants that they could make their own decisions whether to answer and return the questionnaire or withdraw from the research at any time without penalty. I explained clearly the aims and procedures of the study to the participants in the cover letter (see Appendix A). Indeed, the participants could ask any questions directly to the researcher regarding this study by email or phone. I informed the participants that returning the questionnaire to the researcher would be considered as a sign of the participants' consent to participate

in the study. All information and records provided by the participants were confidential.

Chapter Summary

This chapter has detailed the methods used in this study, including selecting the research design, selecting the participants, constructing and administrating the instruments, and analysing the data. The research ethics in dealing with participants also been spelled out in this chapter. In Chapter 5 I discuss the psychometric analyses of the research instruments.

CHAPTER 5

PSYCHOMETRIC ANALYSIS OF THE RESEARCH INSTRUMENTS

Chapter Overview

This chapter presents the psychometric analysis of the instruments used in this research. There are three major sections. Firstly, I discuss how I handled missing values and outliers in the data. Secondly, I present the results of confirmatory factor analysis (CFA) for all measures in this study. Lastly, I present the results of reliability and normality checks on the final research instruments.

Missing Values and Outliers

Prior to the analyses, I examined all the items for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis (Tabachnick & Fidell, 2001). I examined the variables separately for 452 participants at Time 1 and 253 participants at Time 2. At Time 1, nine cases had a large amount of data missing, where none of the items in the criterion measures (i.e. GHQ-12, job satisfaction scale, affective commitment scale, and turnover intentions scale) were answered by the participants. Therefore, I removed these nine cases from the analysis, leaving 443 of the original 452 at Time 1. At Time 2, I found that there were no missing data.

I verified that no errors were made in the data entry and checked for potential multivariate outliers using the Mahalanobis distance test with SPSS 17. The Mahalanobis test is the most common approach for detecting multivariate outliers (Tabachnick & Fidell, 2001). By using a Mahalanobis distance with $p < 0.001$, fourteen participants (about 3%) were identified as multivariate outliers at Time 1. These were deleted, resulting in a final sample of 429. At Time 2, eight participants were identified as multivariate outliers and deleted, leaving 245 participants for the final analyses.

Confirmatory Factor Analyses

I tested the factor structures of the variables through confirmatory factor analysis (CFA) using AMOS 18 with maximum likelihood estimation. I conducted a CFA for each measure (i.e. job demands, job control, GHQ-12, social support, self-efficacy, job satisfaction, affective commitment, turnover intentions, and job performance) to examine the model fit and the distinctiveness of the measures.

Goodness of fit. In order to assess whether the CFA results indicated the variables were adequate, I examined the results of multiple fit indices following Kline (2005). I report the following fit indices: the model chi-square (χ^2), the root-mean-square error of approximation (RMSEA) with 90% confidence interval, the Bentler comparative fit index (CFI), and the root mean square residual (RMR). In addition to these indices, the normed chi square value (ratio of chi square to df; χ^2/df), the GFI index, the Akaike information criterion (AIC) and the Consistent AIC (CAIC) were also examined.

Parameter estimates. In addition to the model fit, I also examined the parameter estimates, including standardised factor loadings and factor correlations. The literature contains various suggestions for acceptable levels for factor loadings (Greeno, Hughes, Hayward, & Parker, 2007). In the present study, I set the criterion for acceptable standardised factor loadings at >0.30 as recommended by Brown (2006). In applied factor analytic research, standardised factor loadings of 0.30 and above are commonly used to operationally define a salient factor loading (Brown, 2006). The size of factor correlations in multifactor CFA solutions should also be interpreted with regard to the discriminant validity of the latent constructs. I used a factor correlation that exceeds 0.80 as the criterion to define poor discriminant validity (Brown, 2006; Kline, 2005).

Job demands

I originally examined job demands as comprising four dimensions: attention demands (AD), problem-solving demands (PSD), responsibility demands (RD) and quantitative demands (QD). The first step in this analysis was to test whether they were distinctive or not. I tested the goodness-of-fit of the job demands models at Times 1 and 2. Initially, I conducted CFA on the four-factor model of

the job demands scale. The results in Table 5.1 indicate that the initial CFA of the four-factor model yielded an unacceptable model fit at both times. An inspection of the factor correlations between the latent constructs indicated that the correlation between AD and PSD had poor discriminant validity because the factor correlation between AD and PSD exceeded 0.80 at both times. This result suggests that AD and PSD form a single factor. Therefore, I conducted a CFA on a three-factor model.

Table 5.1. The confirmatory factor analysis for job demands

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
4-factor	831.75	240	3.5	0.05	0.08	0.87	0.87	1001.75	1431.98
3-factor	849.84	240	3.5	0.06	0.08	0.87	0.86	1019.84	1450.06
2-factor	728.72	224	3.3	0.06	0.07	0.89	0.87	933.34	1444.55
1-factor	398.60	188	2.1	0.05	0.05	0.95	0.93	672.60	1366.02
<i>Time 2 (n = 245)</i>									
4-factor	607.99	247	2.5	0.08	0.08	0.86	0.83	763.99	1115.09
3-factor	635.69	250	2.5	0.08	0.08	0.85	0.83	785.70	1123.29
2-factor	528.23	241	2.2	0.07	0.07	0.89	0.86	696.23	1074.33
1-factor	278.46	191	1.5	0.06	0.04	0.97	0.92	546.46	1149.62

Note. The 4-factor model included attention demands as one factor, problem-solving demands as another factor, responsibility demands as the third factor, and quantitative demands as the fourth factor; the 3-factor model included combined attention demands and problem-solving demands as one factor, and responsibility demands as the second factor, and quantitative demands as the third factor; the 2-factor model included combined attention demands, problem-solving demand, responsibility as one factor and quantitative demands as the other factor; and the 1-factor combined all dimensions into one factor.

The three-factor model included the combined AD and PSD as one factor, RD as the second factor, and QD as the third factor. I ran this model with a re-specification of the model as suggested by the modification indices. As shown in Table 5.1, the modified version of the three-factor model was also not acceptable. Therefore, I tested an alternative analysis of a two-factor model and a one-factor model of the job demands measures. I conducted the CFA of these models with re-specification of the models as suggested by modification indices. The two-factor model combined AD, PSD, and RD as one factor and QD as the other factor. The results in Table 5.1 indicated that the two-factor model also did not fit

the data well. The one-factor model combined all items from the AD, PSD, RD and QD scales as one factor. The fit indices (see Table 5.1) suggested that the one-factor model does fit the data well when three items were deleted (i.e. QD6, QD8, and QD9) because they loaded below 0.30. These deleted items were ‘*Can you do your work in comfort?*’ (QD6), ‘*Do you have too little work?*’ (QD8), and ‘*Do you have problems with the pace of work?*’ (QD9).

Based on the CFA results, the one-factor model provided the most reasonable fit. Hence, I used the one-factor model of the job demands scale for all further analyses (with those three items deleted). Furthermore, I investigated the standardized factor loadings to examine whether all the items loaded strongly on the appropriate factors. The standardized factor loading ranged from 0.30 to 0.65 at Time 1 and from 0.30 to 0.70 at Time 2 (see Appendix E). All the items loaded above 0.30; hence they were all retained.

The results also showed high correlations between factors in the four-factor model, indicating relatively high convergence (Kline, 2005). The correlations in the four-factor model were: responsibility demand ↔ quantitative demands ($r = 0.61$); problem-solving demands ↔ quantitative demands ($r = 0.64$); attention demands ↔ quantitative demands ($r = 0.62$); problem-solving demands ↔ responsibility demands ($r = 0.73$); attention demands ↔ responsibility demands ($r = 0.65$) and attention demands ↔ problem-solving ($r = 0.96$). This provides additional evidence that all items in the job demands model are related to the same underlying construct, further supporting my decision to use a single-factor job demands scale in subsequent analyses.

Job control

I used scales measuring four dimensions of job control in this study. These dimensions were timing control (TC), methods control (MC), skills discretion (SD) and decision authority (DA). I conducted a series of CFAs to obtain the best model fit of job control measures at Times 1 and 2 and to examine the distinctiveness of the four constructs of job control. Initially, I performed a CFA on a four-factor model of job control with no modification, which resulted in these fit values: $\chi^2(146, n = 429) = 536.08, p < 0.01, \chi^2/df = 3.6, RMSEA = 0.08, RMR$

= 0.04, CFI = 0.87, GFI = 0.86 at Time 1 and χ^2 (146, n = 245) = 340.69, $p < 0.01$, $\chi^2/df = 2.3$, RMSEA = 0.07, RMR = 0.06, CFI = 0.89, GFI = 0.87 at Time 2. These results suggest that the four-factor model with no modification did not fit the data well. Thus, I re-conducted the CFA on the four-factor model with a re-specification of the model as suggested by the modification indices. Table 5.2 present the results of CFA for the modified four-factor model of job control at both times.

Table 5.2. The confirmatory factor analysis of job control

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
4-factor	156.45	112	1.4	0.03	0.03	0.99	0.96	312.45	707.24
3-factor	157.72	112	1.4	0.03	0.03	0.98	0.96	313.72	708.52
2-factor	140.90	109	1.3	0.03	0.03	0.99	0.97	302.90	712.88
1-factor	170.01	100	1.7	0.03	0.04	0.98	0.96	350.02	806.38
<i>Time 1 (n = 245)</i>									
4-factor	162.97	125	1.3	0.05	0.04	0.98	0.94	292.97	585.55
3-factor	176.45	129	1.4	0.05	0.04	0.97	0.93	298.45	573.02
2-factor	180.02	127	1.4	0.06	0.04	0.97	0.93	306.02	589.60
1-factor	187.92	122	1.5	0.05	0.05	0.96	0.93	323.92	630.00

Note. The 4-factor model included timing control as one factor, methods control as the other factor, skill discretion as the third factor, and decision authority as the fourth factor; the 3-factor model included combined timing control and methods control as one factor, skill discretion as the second factor, and decision authority as the third factor; the 2-factor model included combined timing control and methods as one factor and combined skill discretion and decision authority as the other factor; and the 1-factor model included combined all dimensions into single factor.

These results indicated that the four-factor model with modification does fit the data well. Moreover, I tested three-, two-, and one-factor models with re-specification of each model. The results of the fit indices of these alternative models exhibited acceptable fit on the basis of the criteria outlined earlier. However, the four-factor model had the smallest AIC and CAIC values, and was therefore chosen for further analyses.

The standardised factor loadings ranged from 0.53 to 0.88 at Time 1 and from 0.30 to 0.80 at Time 2 (see Appendix F). All the items loaded above 0.30; hence they were retained in the four-factor model of job control. The correlations for the four-factor model revealed that all the correlations between latent constructs were below 0.80 (see Appendix G). These results indicate that all the latent constructs of job control had acceptable discriminant validity because none exceeded 0.80 (which is the cutoff suggested by the literature on CFA – see Kline, 2005, p.73).

Social support

I measured three aspects of social support in this study: perceived organisational support (POS), supervisor support (SS) and co-worker support (CS). I conducted a series of CFAs at Times 1 and 2 to examine the distinctiveness of these three constructs. Initially, I conducted a CFA on the three-factor model of social support. The three-factor model included POS as one factor, SS as another factor, and CS as a third factor. The initial CFA of this three-factor model with no modifications resulted in a χ^2 (101, $n = 429$) = 609.94, $p < 0.01$, $\chi^2/df = 6.04$, RMR = 0.18, RMSEA = 0.11, CFI = 0.88, GFI = 0.85 at Time 1 and χ^2 (101, $n = 245$) = 332.27, $p < 0.01$, $\chi^2/df = 3.3$, RMR = 0.11, RMSEA = 0.10, CFI = 0.89, GFI = 0.85 at Time 2. These results suggest that the three-factor model did not fit the data well. Thus, the model was re-specified as suggested by the modification indices. The three-factor model with modification resulted in a χ^2 (74, $n = 429$) = 105.38, $p < 0.01$, $\chi^2/df = 1.4$, RMR = 0.08, RMSEA = 0.03, CFI = 0.99, GFI = 0.97 at Time 1 and χ^2 (85, $n = 245$) = 111.72, $p < 0.01$, $\chi^2/df = 1.3$, RMR = 0.07, RMSEA = 0.04, CFI = 0.99, and GFI = 0.95 at Time 2. The standardized factor loadings of this model indicated two items loading below 0.30 at both times. The items were “*My organisation show very little concern for me*” (POS3) and “*If given the opportunity, my organisation would take advantage of me*” (POS6). Thus, I re-ran the three-factor model with items POS3 and POS6 removed, which resulted in fit indices that were acceptable (see Table 5.3).

I also examined two-factor and one-factor alternative models of the social support scale. The two-factor model combined SS and CS into one factor and POS as the other factor. The one-factor model incorporated all three constructs of perceived organisational support, supervisor support, and co-worker support. The results in

Table 5.3 indicated that both models had an acceptable fit at both times. However, the three-factor model yielded the smallest values of AIC and CAIC. Thus, I chose it for further analysis (after dropping the two items POS3 and POS6).

Table 5.3. The confirmatory factor analysis of social support

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
3-factor	70.85	54	1.3	0.05	0.03	0.99	0.98	172.85	430.98
2-factor	145.17	70	2.1	0.09	0.05	0.98	0.96	277.17	611.23
1-factor	89.01	60	1.5	0.09	0.03	0.99	0.98	241.01	625.68
<i>Time 2 (n = 245)</i>									
3-factor	83.29	64	1.3	0.06	0.04	0.99	0.95	165.30	349.85
2-factor	119.17	81	1.5	0.10	0.04	0.98	0.94	229.17	476.73
1-factor	113.52	71	1.6	0.09	0.05	0.95	0.98	243.52	536.10

Note. The 3-factor model included supervisor support as one factor, co-worker support as another factor, and POS as the third factor; the 2-factor model included combined supervisor support and co-worker support as one factor and POS as the other factor; and the 1-factor model included combined all three factors into one factor.

The standardised factor loadings for all items ranged from 0.64 to 0.89 at Time 1 and 0.42 to 0.90 at Time 2 (see Appendix H). These results indicate that all the items loaded well. The correlations between the latent constructs were below 0.80 as recommended by Kline (2005) (See Appendix I). Thus, all the latent constructs of social support were distinct.

Self-efficacy

Table 5.4 presents the results of the CFA for the one-factor model of self-efficacy. The results revealed that the one-factor model produced good fit statistics at Times 1 and 2. However, the results of standardised factor loadings indicated that two items loaded below 0.30 at both Times 1 and 2. The items were ‘*I have all the skills needed to perform my job very well*’ (SE2) and ‘*I am expert at my job*’ (SE3). Thus, I re-conducted the CFA after removing these two items. The final model with these two items deleted indicated a very reasonable model fit to the data at both times. The one-factor model with two items deleted also yielded

smaller values of AIC and CAIC compared to the one-factor model with no items deleted. Thus, I chose the one-factor model of self-efficacy with two items dropped from the scale, for further analysis.

Table 5.4. The confirmatory factor analysis of self-efficacy

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
1-factor	36.03	18	2.0	0.08	0.05	0.99	0.98	110.03	297.30
1-factor ^a	13.53	10	1.4	0.04	0.03	1.00	0.99	65.53	197.13
<i>Time 2 (n = 245)</i>									
1-factor	43.72	26	1.7	0.08	0.05	0.99	0.96	101.72	232.26
1-factor ^a	26.92	16	1.7	0.08	0.05	0.99	0.97	66.92	156.95

Note. ^a Item SE2 and SE3 deleted from the model.

The modified model resulted in acceptable factor loadings with all the items loaded above 0.30. Standardised factor loadings ranged from 0.35 to 0.87 at Time 1 and 0.30 to 0.82 at Time 2 (see Appendix J).

Psychological strain

I used the GHQ-12 to measure the levels of psychological strain in this study. The GHQ-12 developed by Goldberg and Williams (1988) has recently become the most popular measure of strain because of its relatively good validity in survey studies (Makikangas, et al., 2006). Previous studies have resulted in either one-, two-, or three-factor solutions for the GHQ-12. Almost all studies have found a factor of anxiety/depression (e.g., reflected in such items as ‘constantly under strain’ and ‘unhappy and depressed’) and social dysfunction factor (e.g., reflecting such items as ‘able to concentrate’ and ‘capable of to make decision’ (Kalliath, et al., 2004; Werneke, Goldberg, & Ustun, 2000). In addition to these two factors, some studies have yielded a third factor that expresses a loss of confidence, including such items as ‘thinking of self as worthless’ and ‘loss of confidence in self’ (French & Tait, 2004; Graetz, 1991; Shevlin & Adamson, 2005). A one-factor model of GHQ-12 was suggested by Banks and Jackson (1982) and Winefield, Goldney, Winefield, and Tiggemann (1989).

I ran a series of CFAs for the one-, two-, and three-factor structure of the GHQ-12 based on the information produced by previous studies. Table 5.5 presents a list of items for one-, two-, and three-factor structure of the GHQ-12 scale.

Table 5.5. One-, two-, and three-factor structure of the GHQ-12

Item	One-factor	Two-factor	Three-factor
Able to concentrate (GHQ1)	Strain	S/D	S/D
Lost much sleep over worry (GHQ2)	Strain	A/D	A/D
Play useful part in things (GHQ3)	Strain	S/D	S/D
Capable of making decisions (GHQ4)	Strain	S/D	S/D
Constantly under strain (GHQ5)	Strain	A/D	A/D
Could not overcome difficulties (GHQ6)	Strain	A/D	A/D
Enjoy your normal day-to-day activities (GHQ7)	Strain	S/D	S/D
Face up to problems (GHQ8)	Strain	S/D	S/D
Unhappy or depressed (GHQ9)	Strain	A/D	A/D
Loss of confidence in self (GHQ10)	Strain	A/D	L/C
Thinking of self as a worthless (GHQ11)	Strain	A/D	L/C
Reasonably happy (GHQ12)	Strain	S/D	S/D

Note. A/D = Anxiety/depression; S/D = Social dysfunction; and L/C = Loss of confidence

Table 5.6 presents the results of the CFA for the one-, two-, and three-factor models of the GHQ-12. The results indicate that the three-factor model yielded a $\chi^2(41, n = 429) = 282.43, p < 0.05, \chi^2/df = 6.9, RMSEA = 0.12, RMR = 0.11, CFI = 0.88$ and $GFI = 0.91$ at Time 1 and $\chi^2(51, n = 245) = 231.15, p < 0.05, \chi^2/df = 4.5, RMSEA = 0.14, RMR = 0.12, CFI = 0.86,$ and $GFI = 0.85$ at Time 2. These results suggest that the three-factor model did not fit the data well.

Next I ran the two- and one-factor models with re-specification of the models. The results in Table 5.6 demonstrate that the modified one- and two-factor models of GHQ-12 fit the data well at both times. The two-factor model yielded smaller values of CAIC than the one-factor model. Thus I chose the two-factor model of

GHQ-12 for further analysis. The two constructs of GHQ-12 were anxiety/depression and social dysfunction.

Table 5.6. The confirmatory factor analysis of GHQ-12

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
3-factor	282.43	41	6.9	0.11	0.12	0.88	0.91	356.43	543.71
2-factor	78.13	32	2.4	0.07	0.05	0.98	0.97	158.79	402.96
1-factor	46.79	22	2.1	0.04	0.05	0.99	0.98	170.13	442.24
<i>Time 2 (n = 245)</i>									
3-factor	231.15	51	4.5	0.14	0.12	0.86	0.85	285.15	406.68
2-factor	74.22	36	2.1	0.09	0.06	0.97	0.95	158.22	347.27
1-factor	97.33	38	2.6	0.09	0.08	0.96	0.94	177.33	357.38

The standardised factor loadings for the two-factor model of GHQ-12 ranged from 0.44 to 0.83 at Time 1 and 0.30 to 0.92 at Time 2 (see Appendix K). These results indicate that all the items loaded above 0.30, hence all the items were retained for further analysis. Correlations for the two-factor model of GHQ-12 also revealed that the correlations between anxiety/depression and social dysfunction were 0.20 at Time 1 and 0.21 at Time 2. As a result, the two latent constructs of GHQ-12 were distinct.

Job satisfaction

I conducted a series of CFAs on one- and two-factor models of job satisfaction at both Times 1 and 2. A one-factor model combined all the job satisfaction items into a single factor. The two-factor model included internal job satisfaction as one factor and external job satisfaction as the other factor. Table 5.7 presents the results of the CFA for job satisfaction at Times 1 and 2. The one-factor model showed the better fit to the data at both times, with χ^2 (66, n = 429) = 117.18, χ^2/df = 1.8, RMSEA = 0.04, GFI = 0.97 and CFI = 0.99 at Time 1, and χ^2 (65, n = 245) = 99.74, χ^2/df = 1.5, RMSEA = 0.05, CFI = 0.98, and GFI = 0.96 at Time 2. The one-factor model also yielded smaller values of CAIC than the two-factor

model. Hence, I chose the one-factor model of job satisfaction scale for further analysis.

Table 5.7. The confirmatory factor analysis of job satisfaction

Model	χ^2	Df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
2-factor	326.47	72	4.5	0.09	0.09	0.92	0.91	422.47	665.42
1-factor	117.18	66	1.8	0.05	0.04	0.99	0.97	225.18	498.50
<i>Time 2 (n = 245)</i>									
2-factor	273.64	74	3.7	0.10	0.11	0.88	0.88	635.64	572.70
1-factor	99.74	65	1.5	0.07	0.05	0.98	0.95	209.74	457.31

Note. The 2-factor model included extrinsic satisfaction as one factor and intrinsic satisfaction as the other factor; and the 1-factor model combined all the items into one factor.

The standardised factor loadings of job satisfaction, ranging from 0.48 to 0.76 at Time 1 and 0.38 to 0.74 at Time 2 (see Appendix L). These results indicated that all the job satisfaction items loaded above 0.30. Therefore, all the items were retained for further analysis.

Affective commitment

I ran a CFA for the one-factor model of affective commitment, which included all items of the affective commitment scale at Times 1 and 2. The results (without modification) indicated that the one-factor model did not fit the data well at either time. Therefore, I conducted a CFA with re-specification. Table 5.8 presents the results of the CFA for the modified one-factor model of affective commitment at both times. The results suggest that the modified one-factor model of affective commitment scale exhibited acceptable fit of the data at both times. However, the standardised factor loadings indicated that one item from the affective commitment scale at Time 2 loaded below 0.30 and therefore it was deleted. The item was ‘*I do not feel emotionally attached to this organisation*’ (AC2).

Table 5.8. The confirmatory factor analysis of affective commitment

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
1-factor	26.30	15	1.8	0.02	0.04	0.99	0.99	68.30	174.60
1-factor ^a	20.45	11	1.8	0.01	0.04	0.99	0.99	54.46	140.50
<i>Time 2 (n = 245)</i>									
1-factor	14.93	13	1.2	0.08	0.03	0.99	0.99	60.93	164.46
1-factor ^a	13.26	10	1.3	0.08	0.04	0.99	0.98	49.26	130.28

Note. The 1-factor model combined all items of affective commitment into one factor; ^a Item AC2 deleted from the one-factor model.

The final fit statistics of the one-factor model of affective commitment scale, with item AC2 deleted, were $\chi^2(11, n = 429) = 20.45$, $p > 0.05$, $\chi^2/df = 1.8$, RMSEA = 0.04, RMR = 0.01, CFI = 0.99, GFI = 0.99 at Time 1, and $\chi^2(10, n=245) = 13.26$, $p > 0.05$, $\chi^2/df = 1.3$, RMSEA = 0.04, RMR = 0.08, CFI = 0.99, GFI = 0.98 at Time 2. These results indicated an improvement of the model fit at both times. Consequently, I deleted item AC2 from the affective commitment scale. After deleting item AC2, the factor loadings ranged from 0.35 to 0.83 at Time 1 and 0.32 to 0.92 at Time 2 (see Appendix M). These results indicate that all the remaining items loaded satisfactorily.

Turnover intentions

The turnover intentions scale has only three items, and models using less than four indicators per latent variable are more likely to be underidentified and have error estimates that may be unreliable (Kline, 2005). In order to conduct a CFA for the scale that has below than four items, the parameter estimate of the error term in the first and second item need to be equal. Thus, I performed a CFA for the turnover intentions scale, inserting equal parameter estimates for the error terms for Item 1 and Item 2. The results demonstrated that the model fit the data well, $\chi^2(1, n = 429) = 0.499$, $p > 0.05$ at Time 1 and $\chi^2(1, n = 245) = 0.726$, $p > 0.05$ at Time 2.

The standardized factor loadings of the items indicated that Item 1 (TI1) had a factor loading of 0.84 at Time 1 and 0.92 at Time 2; Item 2 (TI2) had a factor loading of 0.65 at Time 1 and 0.90 at Time 2; and Item 3 (TI3) had a factor loading of 0.76 at Time 1 and 0.92 at Time 2. As a result, I retained all three items as the index of turnover intentions.

Job performance

I measured the level of job performance in this study based on three scales: in-role performance (IRP), organisational citizenship behaviour toward the organisation (OCBO), and organisational citizenship behaviour toward individuals (OCBI). I ran a series of CFAs to obtain the best model fit of job performance at Times 1 and 2 and to examine the distinctiveness of the three constructs.

Initially, I ran a CFA on the three-factor model of job performance with the factors OCBO, OCBI and IRP. The three-factor model with no modifications indicated an unacceptable fit to the data at both times (see Table 5.9). Therefore, I modified the three-factor model based on the results of modification indices. The correlations between the constructs (i.e. factor correlations between OCBO and IRP = 0.88; OCBO and OCBI = 0.87; and OCBI and IRP = 0.84 at Time 1) indicate a poor discriminant validity of the latent constructs, suggesting these latent constructs form a single factor.

I next ran a CFA on the two-factor model, which combined OCBO and OCBI as one factor and IRP as the other factor. I distinguished these two factors based on the conceptualisation of organisational citizenship behaviour (OCB) that consists of OCBO and OCBI, and IRP as the other concept (Williams & Anderson, 1991). The results in Table 5.9 indicated that the two-factor model had a fairly acceptable fit of the data. However, the correlation between OCB and IRP was high at both times (i.e. 0.90 at Time 1 and 0.92 at Time 2). These results suggested that OCB and IRP form a single factor. The goodness-of-fit indices suggest that the one-factor model fitted the data well at both times (see Table 5.9).

Table 5.9. The confirmatory factor analysis of job performance

Model	χ^2	df	χ^2/df	RMR	RMSEA	CFI	GFI	AIC	CAIC
<i>Time 1 (n = 429)</i>									
3-factor	796.60	157	5.1	0.20	0.10	0.88	0.85	944.60	1319.15
2-factor	421.75	149	2.8	0.16	0.07	0.95	0.91	585.75	1000.79
1-factor	240.32	132	1.8	0.14	0.04	0.98	0.95	438.32	939.40
<i>Time 2 (n = 245)</i>									
3-factor	440.32	171	2.6	0.23	0.08	0.90	0.86	560.31	830.39
2-factor	372.10	156	2.4	0.23	0.08	0.92	0.88	522.10	859.69
1-factor	242.05	139	1.7	0.17	0.06	0.96	0.92	426.05	840.17

Note. The 3-factor model included OCBO as one factor, OCBI as the second factor and IRP as the third factor; the 2-factor model included combined OCBO and OCBI as one factor and IRP as the other factor; and the 1-factor model combined all items into a single factor.

The standardised factor loadings revealed that one item at Time 1 and three items at Time 2 loaded below 0.30. The items are ‘*I complain about insignificant things at work*’ (OCBO5), ‘*I take time to listen to my co-workers’ problems and worries*’ (OCBI4), ‘*Sometimes I fail to perform essential duties of my job*’ (IRP5), and ‘*I engage in activities that will directly affect my performance evaluation*’ (IRP7). Consequently, I deleted these items in the model. The model fit of the one-factor model after deleting the items, yielded χ^2 (85, n = 429) = 173.06, $p < 0.01$, $\chi^2/df = 2.0$, RMSEA = 0.05, RMR = 0.10, CFI = 0.98, GFI = 0.96, AIC = 309.06, and CAIC = 653.24 at Time 1, and χ^2 (88, n = 245) = 161.62, $p < 0.01$, $\chi^2/df = 1.8$, RMSEA = 0.06, RMR = 0.11, CFI = 0.97, GFI = 0.94, AIC = 291.62, and CAIC = 584.21 at Time 2. I also considered the issue of parsimony (AIC and CAIC values) with smaller values representing a better fit of the model (Hu & Bentler, 1995). The AIC and CAIC values revealed that the one-factor model was better than the three- or two-factor model. Consequently, I used the one-factor model for further analyses. The standardised factor loadings ranged from 0.31 to 0.88 at Time 1 and 0.32 to 0.92 at Time 2 (see Appendix N).

Reliability and Normality Analysis

After I conducted the CFAs on each measure, I calculated Cronbach alpha coefficients in SPSS 17 to examine the internal reliabilities of the measures. Based on the CFA results, there were 15 variables in this study. All the variables had acceptable Cronbach alpha coefficients at both Times 1 and 2, ranging from 0.74 to 0.92 at Time 1 and 0.74 to 0.94 at Time 2 (see Appendix O). Prior to additional analysis, I tested the study variables for normality, using skewness and kurtosis statistics. Normality indices showed appropriate levels of univariate skewness and kurtosis for all variables (see Appendix P).

Chapter Summary

This chapter presented the results of the confirmatory factor analyses of the research instruments. The results showed that the job demands scales formed one dimension; job control has four dimensions, (i.e. timing control, methods control, skill discretion and decision authority); psychological strain has two dimensions (i.e. anxiety/depression and social dysfunction); social support has three dimensions (i.e. perceived organisational support, supervisor support, and co-worker support); self-efficacy is a single dimension; job satisfaction is one dimension; affective commitment has one dimension; turnover intentions has one dimension; and job performance has a single dimension. All of these measurement models were carried forward into the theoretical model testing phase.

In the next two chapters (Chapters 6 and 7), I discuss the correlations between the study variables and the hypotheses tests of the main and moderating effects for both cross-sectional and longitudinal analyses.

CHAPTER 6

CROSS-SECTIONAL ANALYSES OF MAIN AND MODERATING EFFECTS

Chapter Overview

This chapter presents the results of the cross-sectional analyses for the data collected at Time 1 and Time 2. It has four main sections. Firstly, I describe the descriptive statistics (means and standard deviations) at both Times 1 and 2. Secondly, I present the correlation analyses of the variables involved in this study at both times. I discuss the correlation between demographic variables and study variables and the correlations between study variables. Lastly, I present the multivariate analyses of main effect and moderated effect hypotheses for both Time 1 and Time 2.

Descriptive Analysis

Table 6.1 displays mean values, standard deviations and t-tests at Times 1 and 2. Paired-samples t-tests were used to test for the ‘stability’ of the variables, that is, to determine if their mean level had changed over time. The results indicated that the mean of social dysfunction score at Time 2 ($M = 3.09$) was significantly lower ($t = 3.10$, $p < 0.01$) than the mean of social dysfunction score at Time 1 ($M = 3.23$). There was also a reduction in levels of job demands at Time 2 relative to Time 1. The respondents showed a significantly lower level of job demands at Time 2 ($M = 3.58$) compared with Time 1 ($M = 3.78$). Concerning self-efficacy, there was a significant increase in self-efficacy from Time 1 to Time 2 ($t = -2.42$, $p < 0.05$). Specifically, the respondents showed a significantly higher level of self-efficacy at Time 2 ($M = 4.71$) compared with Time 1 ($M = 4.47$).

Among the ‘outcome’ variables, t-tests indicated that only the global job satisfaction, affective commitment and turnover intentions were significantly different between Time 1 and Time 2, with global job satisfaction and turnover intentions increasing from Time 1 to Time 2 and affective commitment decreasing from Time 1 to Time 2.

Table 6.1. Mean, standard deviation and t-test at Time 1 and Time 2

Variables	Time 1 (n = 429)		Time 2 (n = 245)		t-test ^a
	Mean	SD	Mean	SD	
Job demands ^b	3.78	0.49	3.58	0.54	4.99**
Timing control ^b	3.85	0.72	3.82	0.73	0.41
Methods control ^b	3.99	0.53	4.01	0.56	-0.47
Skill discretion ^c	4.84	0.61	4.91	0.68	-1.27
Decision authority ^c	4.44	0.73	4.46	0.81	-0.84
Perceived org. support ^d	5.12	1.16	5.01	0.86	1.63
Supervisor support ^c	4.44	1.00	4.32	0.96	1.39
Co-worker support ^c	4.57	0.96	4.51	0.94	0.69
Self-efficacy ^d	4.47	1.17	4.71	1.13	-2.42*
Anxiety/depression ^c	2.56	0.81	2.54	0.91	0.40
Social dysfunction ^c	3.23	0.46	3.09	0.47	3.10**
Job satisfaction ^d	5.38	0.90	5.39	0.80	-1.89
Global job satisfaction ^d	5.58	1.14	5.83	1.08	-2.37*
Affective commitment ^d	5.54	0.48	5.33	0.99	3.13**
Turnover intentions ^d	2.04	1.44	2.51	1.84	-2.64**
Job performance ^d	5.78	0.83	5.76	0.75	-0.81

Note. * $p < 0.05$; ** $p < 0.01$.

^a = paired-samples t-test.

^b = Response scale ranged from 1 to 5.

^c = Response scale ranged from 1 to 6.

^d = Response scale ranged from 1 to 7.

Relationships between Demographics and the Study Variables

Table 6.2 presents the correlations between age and job tenure and the study variables at Times 1 and 2. At Time 1 age was significantly positively correlated with perceived organisational support (POS), job satisfaction, and job performance. Tenure was significantly positively correlated with anxiety/depression. The results at Time 2 show that age was significantly positively correlated with anxiety/depression and job performance. Tenure was significantly negatively correlated with anxiety/depression.

Table 6.2. Correlations between age and job tenure and the study variables at Time 1 and Time 2

Variables	Time 1 (n = 429)		Time 2 (n = 245)	
	1	2	1	2
1. Age	-		-	
2. Tenure	0.27**	-	0.75**	-
Job demands	0.01	-0.01	-0.08	0.06
Timing control	-0.01	0.08	-0.06	-0.10
Methods control	-0.04	0.05	0.09	0.02
Skill discretion	0.00	0.01	0.03	-0.03
Decision authority	0.04	0.05	0.05	0.05
POS	0.12*	0.03	0.06	0.12
Supervisor support	0.07	0.07	0.06	0.05
Co-worker support	0.02	0.03	0.05	0.07
Self-efficacy	-0.03	-0.02	0.03	0.04
Anxiety/depression	-0.08	0.15**	-0.16*	-0.17**
Social dysfunction	-0.04	0.00	-0.10	-0.07
Job satisfaction	0.11*	0.03	0.05	0.11
Global job satisfaction	0.04	0.07	0.01	0.05
Affective commitment	0.09	-0.06	-0.01	0.08
Job performance	0.13*	-0.08	0.15*	0.11
Turnover intentions	-0.08	0.02	-0.03	-0.11

* $p < 0.05$; ** $p < 0.01$.

In addition, I conducted t-tests and ANOVAs to examine differences between gender, marital status, education level, and position on the study variables at both times. The results are presented in Tables 6.3 and 6.4. The means and standard deviations for gender differences between the study variables at Times 1 and 2 are presented in Appendices Q and R.

Table 6.3. T-tests between gender and the study variables at Times 1 and 2

Variables	Time 1 (n = 429)	Time 2 (n = 245)
	T-test	T-test
Job demands	-1.236	1.186
Timing control	0.055	1.380
Methods control	1.158	0.741
Skill discretion	-0.884	-2.889**
Decision authority	-1.277	0.686
POS	-1.291	0.837
Supervisor support	-3.231**	-0.993
Co-worker support	-0.683	0.901
Self-efficacy	5.064***	-1.823
Anxiety/depression	-3.201**	2.108**
Social dysfunction	-3.161**	-0.994
Job satisfaction	-2.373*	-0.459
Global job satisfaction	-2.303*	-0.239
Affective commitment	0.486	-1.865
Job performance	1.569	-2.753 **
Turnover intentions	-0.199	2.617**

Note. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.01$.

The results in Table 6.3 show a significant difference between males and females on anxiety/depression at both times, whereas there was only a significant difference on social dysfunction at Time 1, but not at Time 2. On average, anxiety/depression was experienced more by males ($M = 2.62$, $SD = 0.81$) than females ($M = 2.27$, $SD = 0.78$) at Time 1. Similarly, males ($M = 3.24$, $SD = 0.45$) experienced greater social dysfunction compared to females ($M = 3.05$, $SD = 0.43$) at Time 2. There was also a significant difference between males and females on job satisfaction at Time 1, but not at Time 2. Specifically, at Time 1 males ($M = 5.42$, $SD = 0.89$) felt more satisfied compared to females ($M = 5.14$, $SD = 0.90$). Gender differences were found on job performance and turnover intentions at Time 2 only. Males ($M = 5.84$, $SD = 0.83$) reported higher job performance than females ($M = 5.46$, $SD = 0.93$). Females ($M = 3.11$, $SD = 2.17$) experienced higher turnover intentions than males ($M = 2.36$, $SD = 1.71$) at Time 2.

Table 6.4. ANOVA of marital status, education level and position on the study variables at Times 1 and 2

Variables	Time 1			Time 2		
	MAR	EDU	POS	MAR	EDU	POS
Job demands	1.457	1.227	1.470	0.710	1.172	0.109
Timing control	0.385	0.647	1.501	2.299	1.828	0.310
Methods control	0.079	0.201	0.964	1.870	4.027*	3.835*
Skill discretion	3.109*	0.792	1.499	1.108	0.361	0.268
Decision authority	4.000*	3.010*	2.637*	0.903	2.867*	0.258
POS	2.018	1.018	7.340***	1.472	1.320	1.211
Supervisor support	0.341	0.629	6.496***	0.421	5.949**	1.254
Co-worker support	0.102	0.944	2.651*	0.001	0.472	1.656
Self-efficacy	1.528	2.389	1.953	0.216	1.381	2.090
Anxiety/depression	0.260	2.559*	2.727*	0.994	0.664	2.562*
Social dysfunction	5.303**	0.554	0.625	1.156	2.174	1.267
Job satisfaction	0.697	1.492	3.335**	0.645	0.257	1.922
Global job satisfaction	0.610	1.401	3.315**	0.322	3.385**	0.487
Affective commitment	0.806	2.336	0.252	2.651	0.138	2.657*
Job performance	0.919	0.901	2.003	0.138	1.430	2.332
Turnover intentions	2.015	5.068**	0.183	1.728	0.733	1.135

Note. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. MAR = marital status, EDU = education level, and POS = position.

The results in Table 6.4 show that there was a significant difference between education levels on anxiety/depression at both Times 1 and 2. Marital status had a significant effect on social dysfunction at Time 1, but not at Time 2. There was also a significant effect of position on job satisfaction at Time 1, but not at Time 2. Also, position had a significant effect on affective commitment at Time 2, but not at Time 1. Furthermore, there was a significant effect of education levels on turnover intentions at Time 1 but not at Time 2.

It was concluded that the Time 2 control variables were different to those at Time 1. If the demographic variable was related to any of the criterion variables, either at Time 1 or at Time 2, I decided to include it as a control variable in further analyses. The rationale for this approach was to facilitate comparison of the

results between Time 1 and Time 2. Previous research also proposed that demographic variables might be related to the criterion variables. Hence, I combined results from Time 1 and Time 2 to determine the control variables for each criterion variable. Specifically, age, gender, marital status, education level, position, and work tenure were tested as control variables for psychological strain; age and gender for job performance; age, gender, and position for job satisfaction, position for affective commitment; and gender, marital status, and education level for turnover intentions in the regression analyses.

Correlations among the Study Variables

Tables 6.5 and 6.6 present the correlations between the study variables at Times 1 and 2. In general, most of the correlations between the study variables were in the expected direction at both times. There was a high correlation between methods control and timing control at Times 1 and 2 ($r = 0.69$ and 0.60 , respectively), between supervisor support and co-worker support at Times 1 and 2 ($r = 0.70$ and 0.61 , respectively), between perceived organisational support (POS) and job satisfaction at Times 1 and 2 ($r = 0.73$ and 0.66 , respectively), between anxiety/depression and self-efficacy at Times 1 and 2 ($r = -0.65$ and -0.66 , respectively), and between job satisfaction and global job satisfaction at Times 1 and 2 ($r = 0.67$ and 0.74 , respectively). The very high correlation between job satisfaction and global job satisfaction at Times 1 and 2 suggests that these variables overlapped considerably. Thus I only used the job satisfaction scale with 15 items to measure the levels of job satisfaction among the respondents in this study.

At Time 1, job demands were significantly positively correlated with anxiety/depression but not correlated with social dysfunction. At Time 2 job demands were significantly positively correlated with anxiety/depression and social dysfunction. Timing control was not significantly related to anxiety/depression and social dysfunction at Time 1. At Time 2, timing control was significantly negatively correlated with social dysfunction but not correlated with anxiety/depression. Furthermore, methods control was significantly negatively correlated with anxiety/depression and social dysfunction at Time 1. However, at Time 2 methods control was significantly negatively correlated with

social dysfunction only, but not correlated with anxiety/depression. Skill discretion was significantly negatively correlated with anxiety/depression and social dysfunction at Time 1. Nonetheless, at Time 2 skill discretion was only significantly negatively correlated with social dysfunction but not correlated with anxiety/depression. Decision authority was significantly negatively correlated with social dysfunction but not related to anxiety/depression at Times 1 and 2.

POS and supervisor support were significantly negatively correlated with social dysfunction but not with anxiety/depression at both times. Co-worker support was not significantly correlated with anxiety/depression and social dysfunction at Time 1. Nevertheless, at Time 2 co-worker support was significantly positively correlated with anxiety/depression but negatively correlated with social dysfunction. Self-efficacy was significantly negatively correlated with anxiety/depression and social dysfunction at both Times 1 and 2.

Anxiety/depression and social dysfunction were significantly negatively related to job satisfaction at Time 1. Only social dysfunction was significantly negatively related with job satisfaction at Time 2. Meanwhile, anxiety/depression and social dysfunction were significantly correlated with affective commitment at both times. At Time 1, anxiety/depression was significantly positively correlated with turnover intentions but social dysfunction was not correlated with turnover intentions. Anxiety/depression and social dysfunction were significantly positively correlated with turnover intentions at Time 1 but not Time 2. Anxiety/depression and social dysfunction were significantly negatively correlated with job performance at Time 1 and Time 2. Job satisfaction and affective commitment were significantly positively correlated with job performance at both times. Turnover intentions were significantly negatively correlated with job performance at both times.

To conclude, job demands correlated significantly with anxiety/depression at both times, but only correlated with social dysfunction at Time 2. Timing control, methods control and skill discretion were correlated with social dysfunction. Methods control and skill discretion were correlated with anxiety/depression at Time 1 but not Time 2. Decision authority was correlated with social dysfunction but not anxiety/depression at both times. POS and supervisor support were

correlated with social dysfunction but not with anxiety/depression. Co-worker support was negatively correlated with social dysfunction but positively correlated with anxiety/depression at Time 2. Self-efficacy was correlated with psychological strain at both times. Anxiety/depression and social dysfunction were negatively correlated with job satisfaction at Time 1, but only social dysfunction was correlated with job satisfaction at Time 2. Anxiety/depression and social dysfunction were consistently correlated with affective commitment at both times. Anxiety/depression and social dysfunction were correlated with turnover intentions at Time 2, but only anxiety/depression was correlated at Time 1. Anxiety/depression and social dysfunction were consistently correlated with job performance at both times. Job satisfaction, affective commitment, and turnover intentions were also consistently correlated with job performance across both times.

Table 6.5. Cross-sectional inter-correlations between major study variables at Time 1 (n = 429)

Variable	1	2	3	4	5	6	7	8	9
1. Job demands	-								
2. Timing control	0.61**	-							
3. Methods control	0.51**	0.69**	-						
4. Skill discretion	0.29**	0.37**	0.43**	-					
5. Decision authority	0.34**	0.39**	0.34**	0.47**	-				
6. Perceived org. support	0.02	0.10*	0.17**	0.35**	0.34**	-			
7. Supervisor support	0.15**	0.15**	0.16**	0.23**	0.23**	0.48**	-		
8. Co-worker support	0.18**	0.18**	0.24**	0.19**	0.18**	0.42**	0.70**	-	
9. Self-efficacy	-0.21**	0.08	0.20**	0.07	-0.05	-0.12*	-0.22**	-0.16**	-
10. Anxiety/depression	0.27**	0.03	-0.14**	-0.16**	-0.03	-0.07	0.07	0.02	-0.65**
11. Social dysfunction	-0.06	-0.09	-0.19**	-0.14**	-0.12*	-0.18**	-0.14**	-0.24	-0.23**
12. Job satisfaction	0.08	0.19**	0.25**	0.38**	0.32**	0.73**	0.55**	0.44**	-0.09
13. Global job satisfaction	0.15**	0.30**	0.32**	0.35**	0.29**	0.42**	0.33**	0.21**	0.09
14. Affective commitment	0.09	0.22**	0.35**	0.45**	0.19**	0.33**	0.18**	0.16**	0.35**
15. Job performance	-0.07	0.20**	0.35**	0.52**	0.21**	0.39**	0.21**	0.19**	0.43**
16. Turnover intentions	0.17**	-0.01	-0.08	-0.12*	-0.05	-0.23**	-0.17**	-0.18**	-0.28**

Table 6.5. continued from previous page

Variable	10	11	12	13	14	15	16
10. Anxiety/depression	-						
11. Social dysfunction	0.20**	-					
12. Job satisfaction	-0.12*	-0.22**	-				
13. Global job satisfaction	-0.11*	-0.13**	0.67**	-			
14. Affective commitment	-0.32**	-0.31**	0.37**	0.35**	-		
15. Job performance	-0.43**	-0.33**	0.40**	0.40**	0.62**	-	
16. Turnover intentions	0.37**	0.08	-0.26**	-0.14**	-0.36**	-0.38**	-0.31**

Note. * $p < 0.05$; ** $p < 0.01$.

Table 6.6. Cross-sectional inter-correlations between major study variables at Time 2 (n = 245)

Variable	1	2	3	4	5	6	7	8	9
1. Job demands	-								
2. Timing control	0.55**	-							
3. Methods control	0.54**	0.60**	-						
4. Skill discretion	0.36**	0.23**	0.34**	-					
5. Decision authority	0.39**	0.41**	0.35**	0.45**	-				
6. Perceived org. support	0.21**	0.12	0.19**	0.27**	0.32**	-			
7. Supervisor support	0.19**	0.19**	0.12	0.24**	0.24**	0.41**	-		
8. Co-worker support	0.35**	0.29**	0.22**	0.27**	0.27**	0.35**	0.61**	-	
9. Self-efficacy	0.02	0.06	0.23**	0.21**	0.21**	-0.10	-0.09	-0.11	-
10. Anxiety/depression	0.23**	0.09	-0.02	-0.06	-0.06	0.04	0.06	0.15**	-0.66**
11. Social dysfunction	0.28**	-0.24**	-0.32**	-0.28**	-0.27**	-0.18**	-0.27**	-0.22**	-0.30**
12. Job satisfaction	0.08	0.07	0.08	0.33**	0.34**	0.66**	0.51**	0.46**	0.01
13. Global job satisfaction	0.06	0.04	0.14*	0.32**	0.25**	0.52**	0.40**	0.35**	0.09
14. Affective commitment	-0.04	-0.11	-0.04	0.35**	0.01	0.11	0.10	-0.03	0.51**
15. Job performance	0.14*	0.07	0.21**	0.53**	0.19**	0.16**	0.17**	0.10	0.61**
16. Turnover intentions	0.12	0.05	0.05	-0.30**	-0.02	-0.05	-0.01	0.01	-0.60**

Table 6.6. continued from previous page

Variable	10	11	12	13	14	15	16
10. Anxiety/depression	-						
11. Social dysfunction	0.21**	-					
12. Job satisfaction	-0.12	-0.22**	-				
13. Global job satisfaction	-0.17**	-0.18**	0.74**	-			
14. Affective commitment	-0.48**	-0.18**	0.24**	0.31**	-		
15. Job performance	-0.61**	-0.21**	0.27**	0.30**	0.58**	-	
16. Turnover intentions	0.62**	0.17**	-0.25**	-0.26**	-0.65**	-0.68**	-0.21**

Note. * $p < 0.05$; ** $p < 0.01$.

Testing the Hypotheses

I used hierarchical regression analysis (Cohen & Cohen, 1983) to estimate the main and moderating hypotheses at Time 1 (n = 429) and Time 2 (n = 245). Given the significant relationships that emerged between study variables and the demographic variables, the potential existed for the demographic variables to influence the various relationships between predictor variables and criterion variables. Hierarchical multiple regression analysis allows one to control for these variables. I conducted preliminary analyses to ensure there was no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. All these assumptions were satisfied in this study.

Relationships between Job Demands, Job Control, Social Support, and Self-efficacy

I tested the main effects of the predictor variables such as job demands, job control variables, social support variables, and self-efficacy on anxiety/depression and social dysfunction. In addition, I tested the interactions between job demands and job control variables (i.e. timing control, methods control, skill discretion, and decision authority), between job demands and social support (i.e. perceived organisational support, supervisor support and co-worker support), and between job demands and self-efficacy. Interaction terms were created by standardising variables before multiplying the variables together as recommended by Jaccard, Turisi, and Wan (1990) to reduce the risk of multicollinearity. I conducted a separate regression for anxiety/depression and social dysfunction.

Results at Time 1

Table 6.7 displays the results of the hierarchical regression of psychological strain on job demands, timing control, skill discretion, decision authority, POS, supervisor support, co-worker support, and self-efficacy on anxiety/depression and social dysfunction at Time 1.

Table 6.7. Hierarchical regression of psychological strain on job demands, job control, social support and self-efficacy at Time 1

Predictor variables	Anxiety/depression			Social dysfunction		
	ΔR^2	ΔF	β	ΔR^2	ΔF	β
Step 1	0.07	5.34***		0.03	2.21*	
Age			-0.12*			-0.09
Gender			-0.11*			0.17**
Marital status			0.04			0.05
Tenure			0.21**			0.02
Position			-0.01			-0.03
Education level			-0.05			-0.02
Step 2	0.43	39.90***		0.15	7.76**	
Job demands (JD)			0.19**			-0.11
Timing control (TC)			-0.13*			0.10
Methods control (MC)			-0.12*			-0.05
Skill discretion (SD)			-0.16**			-0.07
Decision authority (DA)			-0.01			-0.05
POS			0.05			-0.13*
Supervisor support (SS)			0.15			-0.05
Co-worker support (CS)			-0.09			-0.23*
Self-efficacy			-0.59**			-0.27**
Step 3	0.03	1.79*		0.06	4.15**	
JD x TC			-0.07			-0.05
JD x MC			-0.12			0.14*
JD x SD			-0.12			-0.10
JD x DA			-0.05			0.18**
JD x POS			-0.05			-0.03
JD x SS			-0.03			-0.22**
JD x CS			-0.02			-0.10
JD x SE			-0.13*			-0.04
Step 4	0.02	1.27		0.04	1.91*	
JD x TC x POS			-0.13			0.15
JD x TC x SS			-0.07			0.32*
JD x TC x CS			0.14			0.20
JD x MC x POS			0.15			0.09
JD x MC x SS			-0.03			0.16
JD x MC x CS			0.05			-0.20

Table 6.7. continued from previous page

Predictor variables	Anxiety/depression			Social dysfunction		
	ΔR^2	ΔF	β	ΔR^2	ΔF	β
JD x SD x POS			-0.07			-0.04
JD x SD x SS			-0.12			0.08
JD x SD x CS			-0.01			0.05
JD x DA x POS			-0.05			-0.12
JD x DA x SS			0.03			0.30**
JD x DA x CS			-0.06			-0.18
Overall R^2		0.55			0.28	

Note. $n = 429$. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Estimates are standardised regression coefficients.

Main effects hypotheses at Time 1

For anxiety/depression, the results in Table 6.7 show that job demands, timing control, skill discretion, decision authority, POS, supervisor support, co-worker support, and self-efficacy together explained 43% of the variance in anxiety/depression. Job demands ($\beta = 0.19$), timing control ($\beta = -0.13$), methods control ($\beta = -0.12$), skill discretion ($\beta = -0.16$), and self-efficacy ($\beta = -0.59$) were significantly related to anxiety/depression. These results indicated that high job demands related to high anxiety/depression, and low timing control, method control, skill discretion, and self-efficacy related to high anxiety/depression. These results support Hypotheses 1a, 3a(i), 3b(i), 3c(i), and 13a for anxiety/depression at Time 1. Nevertheless, Hypotheses 3d(i), 7a(i), 7b(i), and 7c(i) were not supported.

For social dysfunction at Time 1, the results demonstrate that the combination of job demands, timing control, methods control, skill discretion, decision authority, POS, supervisor support, co-worker support and self-efficacy explained 15% of the variance in social dysfunction. Only perceived organisational support ($\beta = -0.13$), co-worker support ($\beta = -0.23$) and self-efficacy ($\beta = -0.27$) were significantly related to social dysfunction. These results support Hypotheses 7a(ii), 7c(ii), and 13b for social dysfunction at Time 1. However, job demands, timing control, methods control, skill discretion, decision authority, and

supervisor support were not significantly related to social dysfunction, thus not supporting Hypotheses 1b, 3a(ii), 3b(ii), 3c(ii), 3d(ii), and 7b(ii).

Moderating effects of job control at Time 1

I also tested the moderating effects of timing control (Hypothesis 5a), methods control (Hypothesis 5b), skill discretion (Hypothesis 5c) and decision authority (Hypothesis 5d) on the relationship between job demands and the psychological strain components, i.e. anxiety/depression and social dysfunction.

For anxiety/depression at Time 1, the results in Table 6.7 (p.136-137) show that none of the interactions between job demands and the job control variables were significant. These results fail to support Hypotheses 5a, 5b, 5c and 5d for anxiety/depression at Time 1. For social dysfunction at Time 1, the results show that only the interaction between job demands and methods control and between job demands and decision authority were significant. I plotted the interactions using simple effects equations (Aiken & West, 1991), with values one standard deviation above and below the mean. These interactions are illustrated in Figures 6.1 and 6.2.

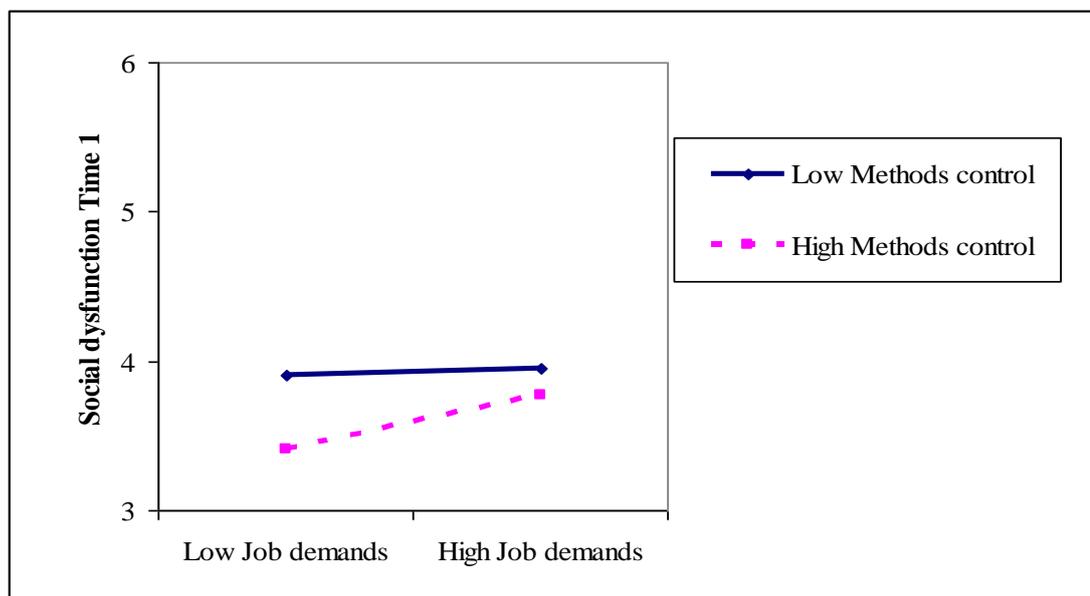


Figure 6.1. Interaction between job demands and methods control on social dysfunction at Time 1

Figure 6.1 shows a positive relationship between job demands and social dysfunction at Time 1 among those who reported higher methods control, whereas levels of job demands were not related to social dysfunction at Time 1 for low methods control respondents. That is, high job demands were related to social dysfunction only when methods control was high, but were insignificant in the experience of social dysfunction when methods control was low. Therefore, Hypothesis 5b was contradicted for social dysfunction.

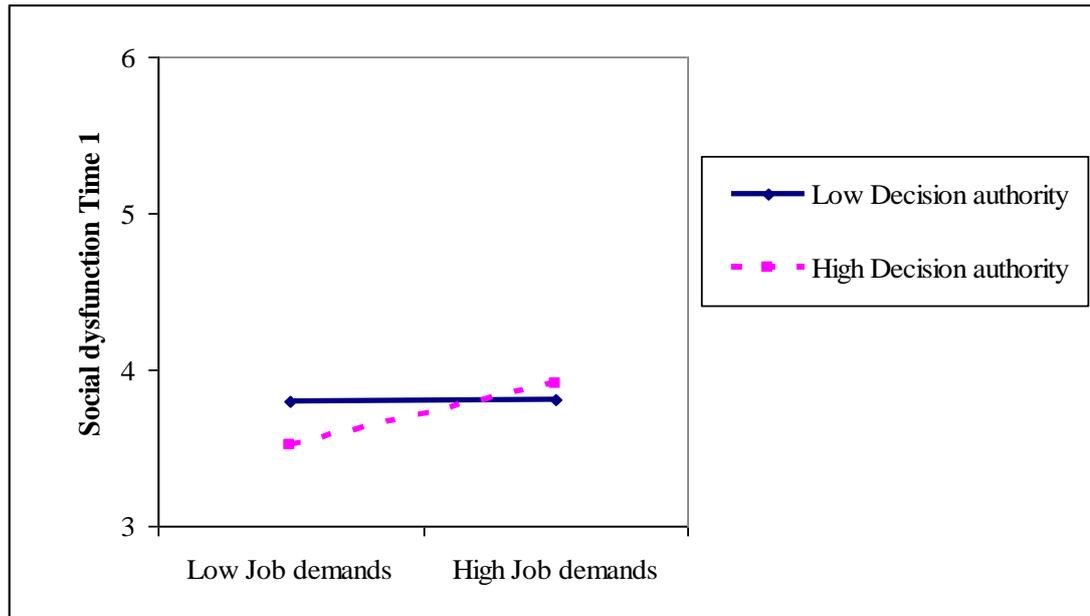


Figure 6.2. Interaction between Job Demands and Decision Authority on Social Dysfunction at Time 1

Figure 6.2 has a similar pattern to Figure 6.1. For high-decision authority respondents, levels of social dysfunction were high when job demands were high rather than when job demands were low, contradicting Hypothesis 5d for social dysfunction

Moderating effects of social support at Time 1

Additionally, I tested moderation effects of social support (i.e. perceived organisational support (POS), supervisor support, and co-worker support) in the relationship between job demands and psychological strain. Following the Job Demands-Control Support (JDCS) Model, I also tested the three-way interaction between job demands, job control, and social support. Nonetheless, the results

(see Table 6.7, p.136-137) presents that none of the interaction terms were significant in predicting anxiety/depression, failing to support Hypotheses 9 and 10 for anxiety/depression.

For social dysfunction at Time 1, the results show that only the interaction between job demands and supervisor support ($\beta = -0.22$) was statistically significant. In addition, the three-way interaction terms explained 4% of the variance in social dysfunction. Specifically, the results display that the interaction between job demands, timing control, and supervisor support ($\beta = 0.32$), and between job demands, decision authority, and supervisor support ($\beta = 0.30$) were statistically significant, thus supporting Hypotheses 9b(ii) and 11b(ii). Nevertheless, Hypotheses 9a(i), 9a(ii), 9b(i), 9c(i), 9c(ii), 11a(i), 11a(ii), 11b(i), 11c(i), and 11c(ii) were not supported.

For a more specific test of my hypotheses, I plotted the interactions following Dawson and Richter (2006). I also conducted additional analyses to test the statistical significance of the simple slopes for the three-way interactions (Aiken & West, 1991). The significant interaction effects are illustrated in Figures 6.3, 6.4 and 6.5.

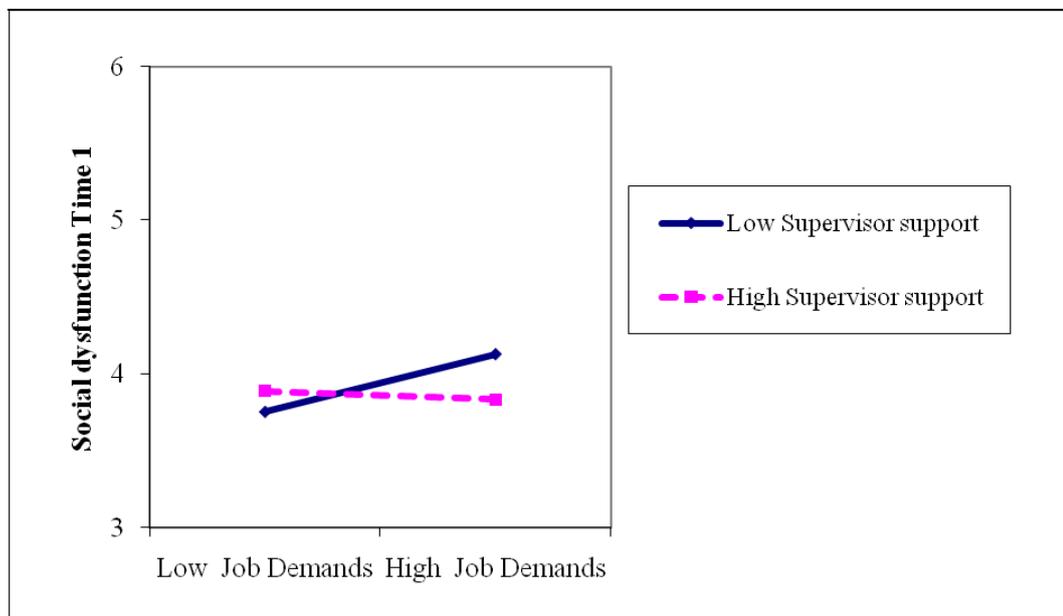


Figure 6.3. Two-way interaction between job demands and supervisor support on social dysfunction at Time 1

Figure 6.3 illustrates the two-way interaction between job demands and supervisor support. Supervisor support moderated the positive relationship between job demands and social dysfunction at Time 1. There is a positive relationship between job demands and social dysfunction at Time 1 among those who reported lower supervisor support, whereas there is no trend among respondents reporting higher supervisor support. In other words, high job demands were positively related to social dysfunction at Time 1 only when supervisor support was low, but not when supervisor support was high.

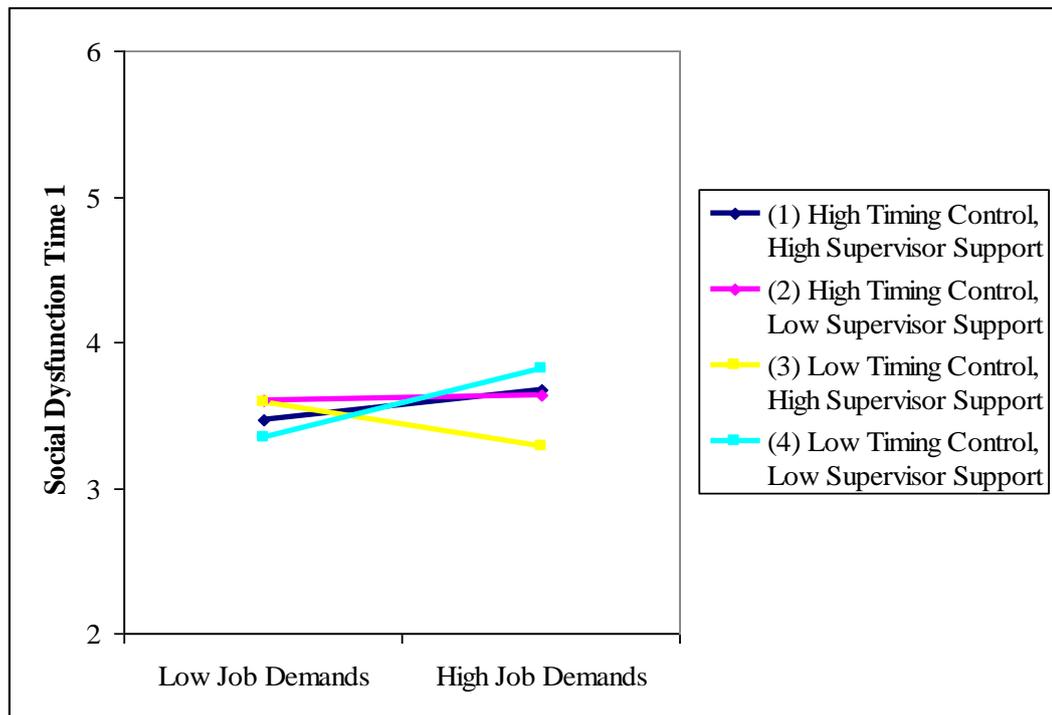


Figure 6.4. Three-way interaction of job demands x timing control x supervisor support on social dysfunction at Time 1

Figure 6.4 displays the three-way interaction between job demands, timing control, and supervisor support in predicting social dysfunction at Time 1. The slope difference test showed that there was a significant difference between the slopes for low timing control and low supervisor support versus low timing control and high supervisor support (see Appendix S). For respondents with low supervisor support and low timing control, job demands were positively related with social dysfunction. For respondents with high supervisor support and low timing control, the relationship between job demands and social dysfunction was negative. These results suggest that supervisor support was important when timing

control was lower. However, there were no differences between the slopes for high timing control plus high supervisor support versus high timing control plus low supervisor support. That means that supervisor support was not important when the level of timing control was higher.

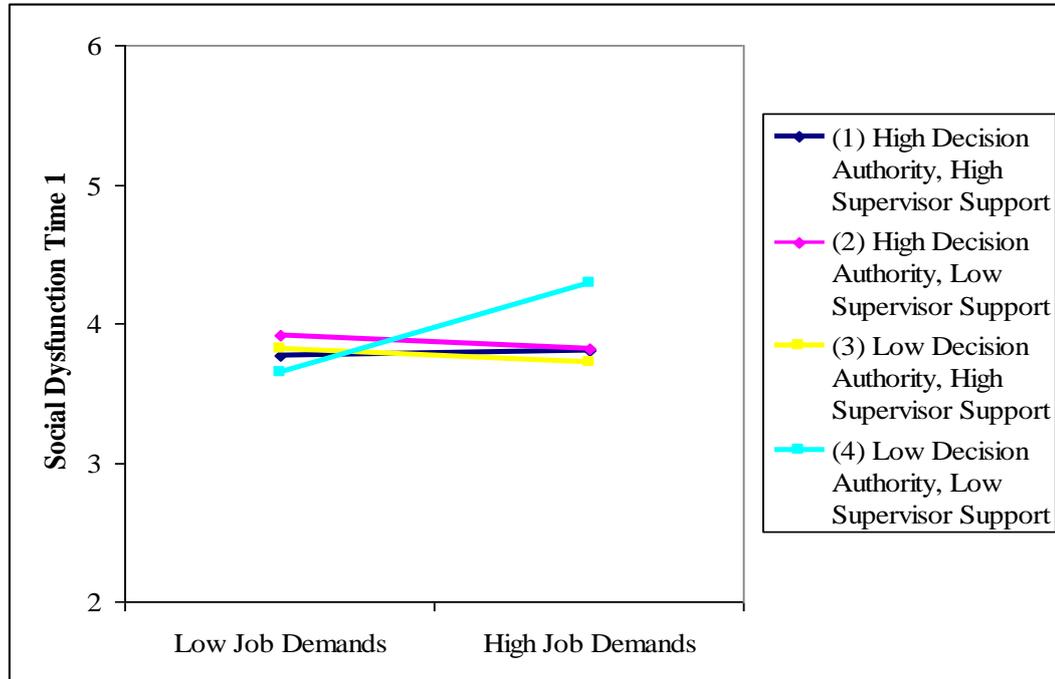


Figure 6.5. Three-way interaction of job demands x decision authority x supervisor support on social dysfunction at Time 1

Figure 6.5 shows the three-way interaction between job demands, decision authority, and supervisor support on social dysfunction at Time 1. The slope difference test showed that only one of the four slopes, that for low decision authority and low supervisor support, reached statistical significance (see Appendix T). The figure illustrates a positive relationship between job demands and social dysfunction among those who reported lower decision authority and supervisor support. Therefore, high job demands were positively related to social dysfunction only when both decision authority and supervisor support were low, but were insignificant in the experience of social dysfunction when both decision authority and supervisor support were high.

Moderating effects of self-efficacy at Time 1

I also tested the two-way interaction between job demands and self-efficacy on anxiety/depression and social dysfunction. At Time 1 (see Table 6.7, p 136-137),

the interaction between job demands and self-efficacy ($\beta = -0.13$) was statistically significant, thus supporting Hypothesis 15a. This interaction is illustrated in Figure 6.6.

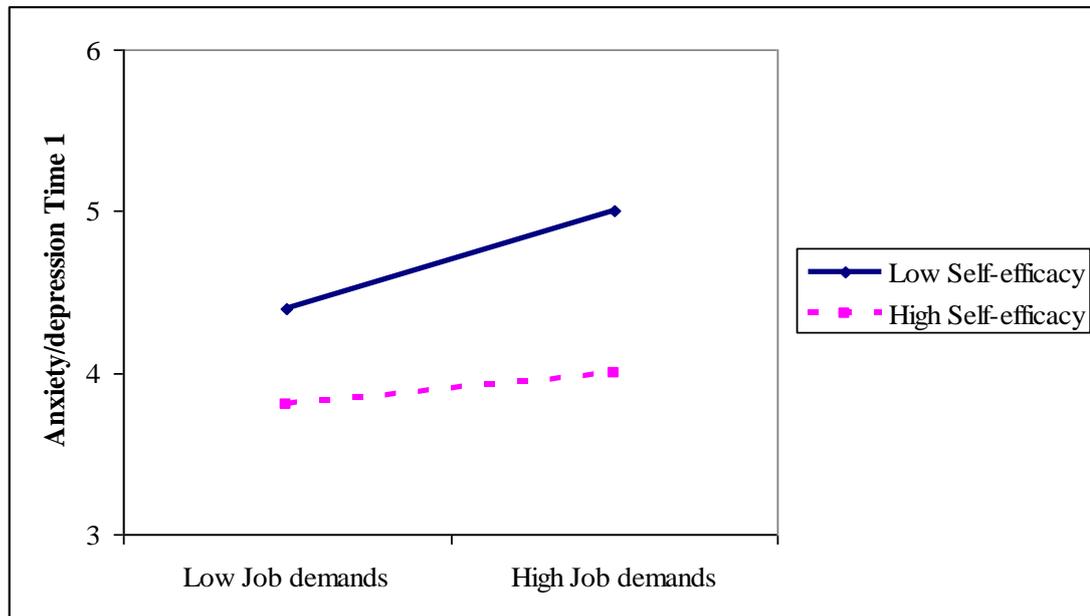


Figure 6.6. Two-way interaction between job demands and self-efficacy on anxiety/depression at Time 1

Figure 6.6 illustrates the interaction between job demands and self-efficacy on anxiety/depression at Time 1. The figure shows that the relationship between job demands and anxiety/depression was positive for respondents with both low and high self-efficacy. However, this relationship was less pronounced for respondents with high self-efficacy. Thus, the positive relationships between job demands and anxiety/depression were stronger when self-efficacy was lower. These results support Hypothesis 15a for anxiety/depression.

Nonetheless, for social dysfunction at Time 1 the results in Table 6.7 (see p.136-137) exhibit that the interaction of job demands x self-efficacy was not significant, failing to support Hypothesis 15b for social dysfunction at Time 1.

Results at Time 2

Table 6.8 presents the results of the main effects of work design, social support, and self-efficacy on anxiety/depression and social dysfunction at Time 2.

Table 6.8. Hierarchical regression of psychological strain on job demands, job control, social support and self-efficacy at Time 2

Predictor variables	Anxiety/depression			Social dysfunction		
	ΔR^2	ΔF	β	ΔR^2	ΔF	β
Step 1	0.04	3.20*		0.03	1.16	
Age			-0.06			-0.12
Gender			-0.13*			0.07
Marital status			-0.01			0.06
Education level			-0.02			-0.09
Position			-0.01			0.09
Tenure			-0.12			0.02
Step 2	0.49	26.66***		0.26	9.11***	
Job demands (JD)			0.26**			-0.10
Timing control (TC)			-0.04			0.01
Methods control (MC)			-0.05			-0.12
Skill discretion (SD)			-0.03			-0.07
Decision authority (DA)			-0.06			-0.08
POS			-0.07			-0.03
Supervisor support (SS)			-0.02			-0.23**
Co-worker support (CS)			0.04			0.02
Self-efficacy			-0.68**			-0.29**
Step 3	0.02	1.51		0.04	1.89*	
JD x TC			0.10			-0.13
JD x MC			-0.17			0.13
JD x SD			-0.03			-0.05
JD x DA			0.04			0.04
JD x POS			-0.05			-0.12
JD x SS			-0.13			-0.23**
JD x CS			-0.08			-0.14
JD x SE			-0.10			-0.06
Step 4	0.04	1.89*		0.06	1.99*	
JD x TC x POS			0.06			0.18
JD x TC x SS			0.13			-0.20
JD x TC x CS			-0.15			0.35
JD x MC x POS			-0.06			-0.05
JD x MC x SS			0.13			0.01
JD x MC x CS			-0.13			-0.32

Table 6.8. continued from previous page

Predictor variables	Anxiety/depression			Social dysfunction		
	ΔR^2	ΔF	β	ΔR^2	ΔF	β
JD x SD x POS			0.09			0.17
JD x SD x SS			-0.03			-0.01
JD x SD x CS			0.19			0.06
JD x DA x POS			-0.04			0.13
JD x DA x SS			-0.28			0.01
JD x DA x CS			-0.02			-0.13
Overall R^2		0.59		0.39		

Note. $n = 245$. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Estimates are standardised regression coefficients.

Main effects hypotheses at Time 2

The results in Table 6.8 show that job demands, timing control, methods control, skill discretion, decision authority, POS, supervisor support, co-worker support and self-efficacy together explained 49% of the variance in anxiety/depression at Time 2. Specifically, only job demands ($\beta = 0.26$) and self-efficacy ($\beta = -0.68$) were significantly related to anxiety/depression. These results support Hypotheses 1a and 13a for anxiety/depression at Time 2, but not Hypotheses 3a(i), 3b(i), 3c(i), 3d(i), 7a(i), 7b(i), and 7c(i).

The results also illustrate that job demands, timing control, methods control, skill discretion, decision authority, POS, supervisor support, co-worker support, and self-efficacy together explained 26% of the variance in social dysfunction Time 2, although only self-efficacy ($\beta = -0.29$) and supervisor support ($\beta = -0.23$) were significantly related to social dysfunction at Time 2. These results support Hypotheses 7b(ii) and 13b for social dysfunction. Nonetheless, job demands, timing control, methods control, skill discretion, decision authority, POS, and co-worker support were not significantly related to social dysfunction at Time 2. Therefore, Hypotheses 1b, 3a(ii), 3b(ii), 3c(ii), 3d(ii), 7a(ii), and 7c(ii) were not supported at Time 2.

Moderating effects of job control at Time 2

Table 6.8 (see p.144-145) also presents the interaction effects of timing control, methods control, skill discretion, and decision authority on the relationship between job demands and anxiety/depression and social dysfunction at Time 2. The results demonstrated that none of the interaction effects of job control variables on anxiety/depression and social dysfunction were statistically significant. These results did not support Hypotheses 5a, 5b, 5c, and 5d at Time 2.

Moderating effects of social support at Time 2

Table 6.8 (see p.144-145) shows the interaction effects of social support on the relationships between job demands and psychological strain at Time 2. For anxiety/depression at Time 2, none of the interaction effects of social support were statistically significant, failing to support Hypotheses 9 and 10.

On the other hand, for social dysfunction at Time 2, the results showed that only the two-way interaction between job demands and supervisor support ($\beta = -0.23$) was statistically significant. However, none of the three-way interactions were significant. Therefore, this study did not provide support for the JDCS model at Time 2 among these technical workers in Malaysia.

Figure 6.7 illustrated the interaction between job demands and supervisor support on social dysfunction at Time 2. The figure shows a positive relationship between job demands and social dysfunction at Time 2 among those who reported lower supervisor support, whereas there is no trend among respondents reporting higher supervisor support. Therefore, high job demands were related to social dysfunction only when supervisor support is low, but were insignificant in the experience of social dysfunction when supervisor support was high. Hypothesis 9b was supported for social dysfunction at Time 2.

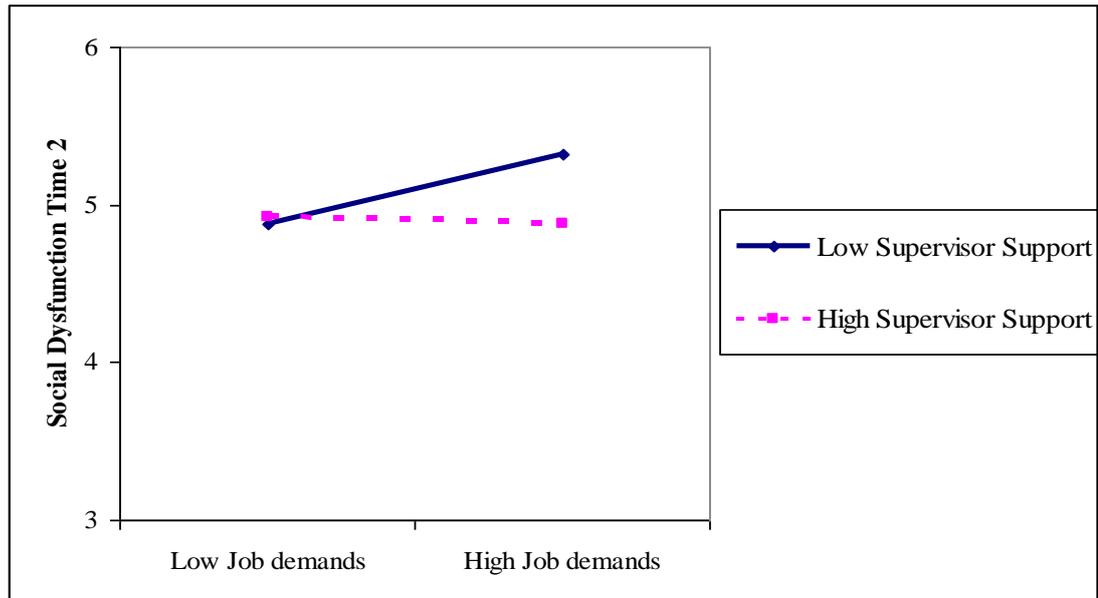


Figure 6.7. Two-way interaction between job demands and supervisor support on social dysfunction at Time 2

Moderating effects of self-efficacy at Time 2

Table 6.8 (see p.144-145) shows the results of the interaction between job demands and self-efficacy on anxiety/depression and social dysfunction at Time 2. The interaction between job demands and self-efficacy on anxiety/depression and social dysfunction at Time 2 was not statistically significant, failing to support Hypotheses 15a and 15b at Time 2.

Summary

In summary, minimal support was found for the main effects hypotheses at both Times 1 and 2. The hypotheses were only partially supported, with job demands being positively related to anxiety/depression but not social dysfunction at both times. Timing control, methods control, and skill discretion were negatively related to anxiety/depression at Time 1, but not social dysfunction. At Time 2 timing control, methods control, skill discretion, and decision authority were not related to anxiety/depression and social dysfunction. POS was only related to social dysfunction at Time 1, but not at Time 2. Supervisor support was related to social dysfunction at Time 2 only. Co-worker support was related to social

dysfunction at Time 1 only. Self-efficacy was the only consistent predictor of anxiety/depression and social dysfunction at both Times 1 and 2.

Concerning the moderating effects of job control variables, the moderating effects were not supported in this study. As a result, the JDC model was not replicated in this Malaysian context. Instead, methods control and decision authority moderated the relationship between job demands and social dysfunction at Time 1, but in the opposite direction. At Time 2, none of the job control variables moderated the relationship between job demands and the psychological strain components (anxiety/depression and social dysfunction).

For the moderating effects of social support variables, the results of my study only provide a minimal support. Specifically, the results found that only supervisor support moderated the relationship between job demands and social dysfunction across time. Additionally, the results at Time 1 but not Time 2 provide little support for the JDCS model. The combination between timing control and supervisor support, and between decision authority and supervisor support moderated the impact of job demands on social dysfunction.

My study found that self-efficacy only moderated the impact of job demands on anxiety/depression but not social dysfunction at Time 1. Yet, the results at Time 2 did not produce significant results for the moderating effects of self-efficacy. Thus, these cross-sectional analyses provide minimal support for the hypothesis.

Main effects of Psychological Strain

I also conducted hierarchical regression analysis to test the hypotheses that anxiety/depression and social dysfunction will be negatively related to job satisfaction (Hypotheses 17a and 17b), affective commitment (Hypotheses 21a and 21b), job performance (Hypothesis 29a and 29b) and positively related to turnover intentions (Hypotheses 25a and 25b). I regressed job satisfaction, affective commitment, job performance, and turnover intentions on anxiety/depression and social dysfunction separately at both Times 1 and 2. Moreover, I controlled for the effects of demographic variables which had significant relationships with the criterion variables.

Job satisfaction

Table 6.9 displays the main effects of anxiety/depression and social dysfunction on job satisfaction at Times 1 and 2.

Table 6.9. Hierarchical regression analysis of job satisfaction on psychological strain

Predictor	Time 1 (n = 429)		Time 2 (n = 245)	
	Step 1	Step 2	Step 1	Step 2
Age	0.14**	0.11*	-0.10	-0.13
Gender	0.10*	0.15**	0.05	0.05
Position	0.09	0.07	-0.16*	-0.15*
Anxiety/depression		-0.09		-0.09
Social Dysfunction		-0.23**		-0.19**
R ²	0.02	0.09	0.02	0.07
ΔR^2	0.02	0.06	0.02	0.05
F change	3.25*	14.35***	1.86*	5.89***
Df	3, 425	2, 423	3, 241	2, 235

Note. *p<0.05; **p<0.01; ***p<0.001; Estimates are standardised regression coefficients.

At Time 1, the regression results showed that anxiety/depression and social dysfunction together explained 6% of the variance in job satisfaction. Social dysfunction ($\beta = -0.23$) but not anxiety/depression was significantly related to job satisfaction at Time 1, thus supporting Hypothesis 17b but not Hypothesis 17a. Anxiety/depression and social dysfunction together explained 5% of the variance in job satisfaction at Time 2. Similar to Time 1, only social dysfunction was significantly related to job satisfaction at Time 2 ($\beta = -0.19$), supporting Hypothesis 17b but not Hypothesis 17a.

Affective commitment

Table 6.10 presents the main effects of anxiety/depression and social dysfunction on affective commitment at Times 1 and 2.

Table 6.10. Hierarchical regression analysis of affective commitment on psychological strain

Predictor	Time 1 (n = 429)		Time 2 (n = 245)	
	Step 1	Step 2	Step 2	Step 2
Position	-0.08	-0.12	-0.17*	-0.17*
Anxiety/depression		-0.28**		-0.46**
Social dysfunction		-0.27**		-0.09
R ²	0.01	0.18	0.02	0.25
ΔR^2	0.01	0.17	0.02	0.24
F change	2.29	43.84***	4.17*	38.02***
Df	1, 427	2, 425	1, 243	2, 241

Note. *p<0.05; **p<0.01; ***p<0.001; Estimates are standardised regression coefficients.

At Time 1, anxiety/depression and social dysfunction explained 17% of the variance in affective commitment. Specifically, anxiety/depression ($\beta = -0.27$) and social dysfunction ($\beta = -0.26$) were significantly related to affective commitment, thus supporting Hypotheses 21a and 21b at Time 1. At Time 2, anxiety/depression and social dysfunction explained 24% of the variance in affective commitment. Anxiety/depression ($\beta = -0.46$) but not social dysfunction was significantly related to affective commitment at Time 2. These results support Hypothesis 21a but not Hypothesis 21b at Time 2.

Turnover intentions

Table 6.11 presents regression analyses of anxiety/depression and social dysfunction on turnover intentions at Times 1 and 2. At Time 1, anxiety/depression and social dysfunction together explained 13% of the variance in turnover intentions. Only anxiety/depression ($\beta = 0.37$) was significantly related to turnover intentions. Thus, Hypothesis 25a was supported at Time 1 but Hypothesis 25b (concerning social dysfunction) was not. At Time 2, anxiety/depression and social dysfunction explained 37% of the variance in turnover intentions. As at Time 1, only anxiety/depression ($\beta = 0.60$) was significantly related to turnover intentions at Time 2, while social dysfunction was

not significant, hence supporting Hypothesis 25a but not Hypothesis 25b at Time 2.

Table 6.11. Hierarchical regression analysis of turnover intentions on psychological strain

Predictor	Time 1 (n = 429)		Time 2 (n = 245)	
	Step 1	Step 2	Step 1	Step 2
Gender	0.02	-0.04	-0.18**	-0.12*
Marital status	0.08	0.07	-0.04	-0.04
Education level	0.08	0.08	-0.06	-0.05
Anxiety/depression		0.37**		0.60**
Social dysfunction		0.01		0.05
R ²	0.02	0.15	0.03*	0.40
ΔR^2	0.02	0.13	0.03	0.37
F change	2.45	33.18***	2.85	73.14***
Df	3, 425	2, 423	3, 241	2, 239

Note. *p < 0.05; ** p < 0.01; ***p < 0.001; Estimates are standardised regression coefficients.

Job performance

Table 6.12 exhibits the regression analyses on job performance at Times 1 and 2. At Time 1, anxiety/depression and social dysfunction explained 26% of the variance in job performance. Anxiety/depression ($\beta = -0.38$) and social dysfunction ($\beta = -0.26$) were significantly related to job performance, thus supporting Hypotheses 29a and 29b. At Time 2, the results show that anxiety/depression and social dysfunction explained 29% of the variance in job performance. As at Time 1, anxiety/depression ($\beta = -0.45$) and social dysfunction ($\beta = -0.17$) were significantly related to job performance at Time 2. These results also support Hypotheses 29a and 29b at Time 2.

Table 6.12. Hierarchical regression analysis of job performance on psychological strain

Variables	Time 1 (n = 429)		Time 2 (n = 245)	
	Step 1	Step 2	Step 1	Step 2
Age	0.14**	0.09*	0.13*	0.04
Gender	-0.07	0.03	0.14*	0.10
Anxiety/depression		-0.38**		-0.45**
Social dysfunction		-0.26**		-0.17**
R ²	0.22	0.26	0.04	0.29
ΔR^2	0.02	0.24	0.04	0.25
F change	4.90**	68.29***	5.07**	43.08***
Df	2, 426	2, 424	2, 242	2, 240

Note. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Estimates are standardised regression coefficients.

To conclude, this study provided some support for the hypotheses of main effects of anxiety/depression and social dysfunction on the outcome variables. The results were also consistent across time. More specifically, social dysfunction but not anxiety/depression was consistently related to job satisfaction at both times. However, anxiety/depression was consistently related to affective commitment at both times, but social dysfunction was related to affective commitment at Time 1 only and not at Time 2. Anxiety/depression but not social dysfunction was consistently related to turnover intentions at both times. Anxiety/depression and social dysfunction were consistently related to job performance at both times.

Main effects of job satisfaction, affective commitment, and turnover intentions on job performance

In this analysis, I tested the hypotheses that high job satisfaction (Hypothesis 19) and affective commitment (Hypothesis 23) will be related to high job performance. In addition, low turnover intentions (Hypothesis 27) will be related to high job performance. In the current analysis, I controlled for the demographic variables which had significant relationships with the criterion variables. I also controlled for the effects of anxiety/depression and social dysfunction because

these variables were related to job performance. Table 6.13 displays the regression results relating to job performance at Times 1 and 2.

Table 6.13. Hierarchical regression of job performance on job satisfaction, affective commitment, and turnover intentions

Predictor variables	Time 1 (N = 429)			Time 2 (N = 245)		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Age	0.14**	0.09*	0.05	0.13*	0.04	0.09
Gender	-0.07	0.03	-0.02	0.14*	0.10	0.05
Anxiety/depression		-0.38**	-0.22**		-0.45**	-0.15*
Social dysfunction		-0.26**	-0.11**		-0.17**	-0.10*
Job satisfaction			0.17**			0.14**
Affective commitment			0.41**			0.22**
Turnover intentions			-0.10*			-0.31**
R ²	0.02	0.26	0.50	0.04	0.29	0.48
ΔR ²	0.02	0.24	0.24	0.04	0.25	0.19
F change	4.90**	68.29***	66.64***	5.07**	43.08***	28.16***
Df	2, 426	2, 424	3, 421	2, 242	2, 240	3, 237

Note. *p<0.05; **p<0.01; ***p<0.001; Estimates are standardised regression coefficients.

At Time 1, after controlling for demographic and psychological strain variables, job satisfaction, affective commitment, and turnover intentions together explained 24% of the variance in job performance. Job satisfaction ($\beta = 0.17$), affective commitment ($\beta = 0.41$), and turnover intentions ($\beta = -0.10$) were significantly related to job performance. These results support Hypotheses 19a, 23a, and 27a at Time 1.

On the other hand, the regression analyses at Time 2 showed that job satisfaction, affective commitment, and turnover intentions together explained 19% of the variance in job performance. As at Time 1, job satisfaction ($\beta = 0.14$), affective commitment ($\beta = 0.22$), and turnover intentions ($\beta = -0.31$) were also significantly related to job performance at Time 2, supporting Hypotheses 19a, 23a, and 27a.

In summary, this study provided support for the hypotheses of the main effects of job satisfaction, affective commitment, and turnover intentions on job

performance at both times. However, the contributions are varied between Time 1 and Time 2, especially for affective commitment and turnover intentions.

Chapter Summary

This chapter presented the cross-sectional findings on the main and moderating effects hypotheses, which yielded support for only some of the hypotheses. The findings suggest that job demands were consistently related to anxiety/depression across time, whereas timing control, methods control, and skill discretion were only related to anxiety/depression at Time 1. The findings also suggest that co-worker support was related to social dysfunction only at Time 1 but not at Time 2. Supervisor support was related to social dysfunction at Time 2 but not at Time 1. In addition, the findings suggest that self-efficacy consistently predicted anxiety/depression and social dysfunction across time. In terms of the main effect of the psychological strain components, the findings suggest that social dysfunction related to job satisfaction across time, whereas anxiety/depression consistently related to affective commitment and turnover intentions across time. Anxiety/depression and social dysfunction related to job performance across time. The findings also revealed that job satisfaction, affective commitment, and turnover intentions also consistently related to job performance at both times.

The moderation analyses found that the hypotheses were only partially supported. The JDC model was not replicated among these technical workers in Malaysia. Supervisor support consistently moderated the relationships between job demands and social dysfunction across time. The combination of timing control and supervisor support and the combination of decision authority and supervisor support moderated the relationships between job demands and social dysfunction at Time 1 but not at Time 2. Thus, there was little support for the JDACS model at Time 1. Self-efficacy also moderated the relationships between job demands and anxiety/depression at Time 1 but not at Time 2. In the next chapter (Chapter 7), I discuss the longitudinal analyses on the main and moderating effects hypotheses to explore the relationships over time.

CHAPTER 7

LONGITUDINAL ANALYSES OF MAIN AND MODERATING EFFECTS

Chapter Overview

This chapter presents the results of the longitudinal analyses of the main and moderating effects. There are four major sections: (a) longitudinal correlation analyses, (b) testing the longitudinal main effect hypotheses, (c) testing the moderating effect hypotheses, and lastly (d) the summary section of this chapter.

Longitudinal Correlation Analysis

Table 7.1 presents the correlations between the study variables at Time 1 and at Time 2. Most of the correlations between the variables were relatively low and in the expected direction. Job demands at Time 1 were significantly positively correlated with anxiety/depression and social dysfunction at Time 2. Timing control at Time 1 was significantly negatively correlated with anxiety/depression at Time 2, but not social dysfunction. Methods control, skill discretion, and decision authority at Time 1 were not significantly correlated with anxiety/depression and social dysfunction at Time 2. Perceived organisational support (POS) at Time 1 was significantly negatively correlated with social dysfunction at Time 2, but not anxiety/depression. Supervisor support and co-worker support at Time 1 were not significantly correlated with anxiety/depression and social dysfunction at Time 2. Self-efficacy at Time 1 was significantly negatively correlated with anxiety/depression at Time 2, but not social dysfunction. Anxiety/depression but not social dysfunction at Time 1 was significantly correlated with job satisfaction, affective commitment, turnover intentions, and job performance at Time 2. Job satisfaction and affective commitment at Time 1 were significantly positively correlated with job performance at Time 2, whereas turnover intentions were significantly negatively correlated with job performance at Time 2.

Table 7.1. Longitudinal correlations between study variables at Times 1 and 2

Variables at Time 1	Variables at Time 2									
	1	2	3	4	5	6	7	8	9	10
1. Job demands	0.26**	0.14*	0.14**	0.09	0.11	-0.01	-0.04	0.02	-0.10	0.27*
2. Timing control	0.07	0.16**	0.13*	0.06	0.10	-0.03	0.02	-0.01	0.26**	-0.19**
3. Methods control	0.17**	0.17**	0.19*	0.13*	0.13*	0.01	0.01	0.06	0.12	-0.06
4. Skill discretion	-0.04	0.06	0.06	0.24*	0.01	-0.06	-0.10	-0.07	0.12	-0.09
5. Decision authority	-0.10	0.05	0.04	0.01	0.20**	-0.03	-0.13*	-0.13*	0.04	-0.09
6. Perceived org. support	-0.09	-0.13*	-0.11	-0.06	-0.11	0.21*	0.13*	0.01	-0.10	0.01
7. Supervisor support	-0.03	-0.04	-0.05	-0.10	-0.06	-0.06	0.24**	0.14*	-0.04	-0.03
8. Co-worker support	0.05	0.11	0.08	-0.07	-0.03	-0.09	0.09	0.23**	0.02	-0.07
9. Self-efficacy	0.03	0.09	0.12	-0.05	0.09	-0.12	-0.08	0.02	0.13*	-0.26**
10. Anxiety/depression	0.20**	-0.24**	-0.06	0.09	-0.05	-0.10	0.02	-0.04	-0.13	0.32**
11. Social dysfunction	0.17**	-0.12	-0.05	0.01	-0.01	-0.17**	0.05	-0.07	-0.18**	0.16**
12. Job satisfaction	-0.13*	0.01	-0.08	0.07	-0.04	0.02	-0.04	0.04	0.07	-0.17**
13. Affective commitment	0.09	0.12	0.10	0.17**	0.11	0.05	0.03	0.08	0.15*	-0.23**
14. Turnover intentions	-0.01	-0.01	-0.04	-0.16**	-0.04	-0.13*	-0.09	-0.08	-0.09	0.26**
15. Job performance	0.14*	0.23**	0.15*	0.18**	0.06	0.04	0.05	-0.01	0.11	-0.15*

Note. * p < 0.05; **p < 0.01. n = 245

Table 7.1. continued from previous page

Variables at Time 1	Variables at Time 2				
	11	12	13	14	15
1. Job demands	0.10	-0.08	-0.09	0.13*	-0.05
2. Timing control	-0.09	0.01	0.09	-0.22**	0.25**
3. Methods control	-0.05	0.03	0.09	-0.14*	0.13*
4. Skill discretion	-0.01	-0.06	0.11	-0.18**	0.18**
5. Decision authority	-0.05	-0.07	0.03	-0.11	0.10
6. Perceived org. support	-0.13*	0.06	-0.05	0.01	0.02
7. Supervisor support	0.05	0.04	-0.08	-0.04	0.07
8. Co-worker support	-0.04	0.02	-0.08	-0.01	0.02
9. Self-efficacy	-0.11	0.02	0.14*	-0.11	-0.11
10. Anxiety/depression	0.06	-0.09	-0.14*	0.16*	-0.16*
11. Social dysfunction	0.05	0.01	-0.02	0.08	-0.09
12. Job satisfaction	0.08	0.14*	0.10	-0.23**	0.21**
13. Affective commitment	-0.12	0.06	0.18**	-0.29**	0.25**
14. Turnover intentions	0.11	-0.23**	-0.24**	0.26**	-0.21**
15. Job performance	-0.06	0.19**	0.15*	-0.26**	0.22**

Note. * p < 0.05; **p < 0.01. n = 245

It was concluded that the longitudinal correlation results indicated many of the correlations between the study variables at Times 1 and 2 were not significant. I conducted longitudinal multivariate analyses to further examine possible longitudinal relationships.

Testing the Longitudinal Hypotheses

This section presents the results of the longitudinal main effects and moderating effects analyses over time. Consistent with the theoretical model depicted in Figure 3.1 (see p.50), I assessed the longitudinal main effects of job demands, job control variables, social support variables, and self-efficacy on the psychological strain components (i.e. anxiety/depression and social dysfunction). Additionally, I examined the potential moderating effects of job control, social support, and self-efficacy in the relationships between job demands and psychological strain. Moreover, I tested the longitudinal main effects of the psychological strain components on job satisfaction, affective commitment, turnover intentions, and job performance. Lastly, I tested the longitudinal main effects of job satisfaction, affective commitment, and turnover intentions on job performance.

Analytical strategy

Similar to the previous analyses, I also conducted a hierarchical regression analysis to test the longitudinal main and moderating effect hypotheses. In order to investigate the main effects of the predictor variables on the criterion variables over time, I applied time-effect method following Finke1 (1995), as illustrated in Figure 7.1. This method proposes that the predictor variable at Time 1 will have an effect on the criterion variable at Time 2, while controlling for the criterion variable at Time 1. This approach also has been shown to avoid the reliability concerns associated with simple change scores (Bergh & Fairbank, 2002).

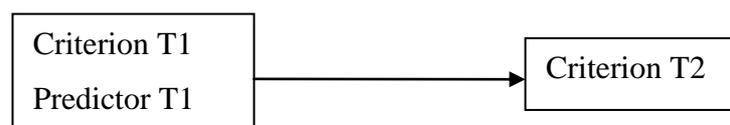


Figure 7.1. Analytical approach for longitudinal main effects

I performed a hierarchical moderated regression (Cohen & Cohen, 1983) to estimate the longitudinal interaction effects of job control, social support, and self-efficacy on the relationships between job demands and the psychological strain components (anxiety/depression and social dysfunction). I tested longitudinal moderation analyses using time-effect methods as illustrated in Figure 7.2. Under this approach, I used the predictor at Time 1 and moderator at Time 1 to predict criterion at Time 2. In addition, I controlled the criterion at Time 1 to control the initial levels of the criterion variable. Similar to the previous analyses, I standardized the predictor and moderator variables before multiplying the variables together to create the cross-product interaction terms.

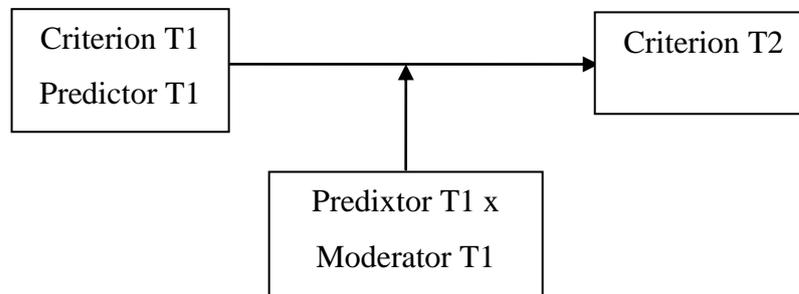


Figure 7.2. Analytical approach for longitudinal moderating effect

More specifically, I first entered the criterion variable at Time 1 to control the initial levels of the criterion variable. Second, I entered the demographic variables which were significantly related to anxiety/depression and social dysfunction as control variables. Third, I entered all the predictor and moderator variables at Time 1. Fourth, I entered the two-way interaction terms. Finally, I entered the three-way interaction terms. I conducted the regression separately for each criterion variable, i.e. T2 anxiety/depression and T2 social dysfunction.

Longitudinal Relationships between Job Demands, Job Control, Social Support, and Self-efficacy

In this section, I examined the longitudinal main effects of job demands, timing control, methods control, skill discretion, decision authority, perceived organisational support (POS), supervisor support, co-worker support, and self-

efficacy on anxiety/depression and social dysfunction over time. Consistent with the theoretical model in Figure 3.1 (see p.50), I also tested the moderation effects of job control, social support, and self-efficacy in the relationships between job demands and psychological strain over time.

Similar to the cross-sectional analyses, I controlled the demographic variables (age, gender, marital status, education levels, position, and tenure) in the hierarchical multiple regression analyses because they were correlated with anxiety/depression and social dysfunction. Also, I controlled for the psychological strain dimensions at Time 1. Table 7.2 presents the results of longitudinal hierarchical regression on anxiety/depression and social dysfunction.

Table 7.2. Longitudinal hierarchical regression of Time 2 psychological strain on Time 1 predictor and Time 1 moderator variables

Predictor variables at Time 1	T2 Anxiety/depression			T2 Social dysfunction		
	ΔR^2	ΔF	β	ΔR^2	ΔF	β
Step 1	0.11	28.59***		0.00	0.06	
Criterion at Time 1			0.32**			0.02
Step 2	0.09	4.20***		0.05	2.16*	
Age			-0.10			-0.11
Gender			-0.16*			0.07
Marital status			0.17*			0.00
Education levels			-0.02			0.14
Position			0.01			0.09
Tenure			-0.09			0.08
Step 3	0.12	4.40***		0.08	2.22*	
Job demands (JD)			0.28**			0.16*
Timing control (TC)			-0.34**			-0.14
Methods control (MC)			0.14			-0.03
Skill discretion (SD)			-0.01			-0.02
Decision authority (DA)			-0.07			-0.07
POS			0.09			-0.21**
Supervisor support (SS)			0.02			-0.06
Co-worker support (CS)			-0.12			-0.14
Self-efficacy			-0.05			-0.04

Table 7.2. continued from previous.

Predictor variables at Time 1	T2 Anxiety/depression			T2 Social dysfunction		
	ΔR^2	ΔF	β	ΔR^2	ΔF	β
Step 4	0.06	2.13*		0.04	1.89*	
JD x TC			0.05			-0.12
JD x MC			0.06			0.15
JD x SD			-0.04			-0.05
JD x DA			0.20**			0.14
JD x POS			-0.14			0.01
JD x SS			0.16			0.08
JD x CS			-0.10			-0.05
JD x SE			-0.16**			-0.16*
Step 5	0.04	1.34		0.03	1.11	
JD x TC x POS			-0.05			-0.09
JD x TC x SS			-0.27			0.14
JD x TC x CS			0.06			0.16
JD x MC x POS			0.06			0.03
JD x MC x SS			0.14			0.05
JD x MC x CS			0.13			0.02
JD x SD x POS			-0.06			-0.11
JD x SD x SS			0.26			0.13
JD x SD x CS			-0.21			-0.08
JD x DA x POS			-0.15			0.17
JD x DA x SS			0.10			-0.11
JD x DA x CS			-0.18			-0.13
Overall R^2		0.41			0.20	

Note. $n = 245$. *** $p < 0.001$, ** $p < 0.01$, and * $p < 0.05$; T2 = Time 2. Estimates are standardised regression coefficients.

Longitudinal main effects hypotheses

Table 7.2 shows that anxiety/depression at Time 1 explained 11% of the variance in anxiety/depression at Time 2. The demographic variables explained 9% of the variance in anxiety/depression at Time 2. Furthermore, T1 job demands, T1 timing control, T1 methods control, T1 skill discretion, T1 decision authority, T1 POS, T1 supervisor support, T1 co-worker support, and T1 self-efficacy together, explained 12% of the variance in T2 anxiety/depression. Only T1 job demands (β

= 0.28) and T1 timing control ($\beta = -0.34$) were statistically significant predictors. As predicted, higher job demands at Time 1 were related to higher anxiety/depression at Time 2, thus supporting Hypothesis 2a. Additionally, lower timing control at Time 1 was related to higher anxiety/depression at Time 2, providing support for Hypothesis 4a(i).

Methods control, skill discretion, decision authority, POS, supervisor support, co-worker support, and self-efficacy at Time 1 were not significantly related to anxiety/depression at Time 2. These results fail to support Hypotheses 4b(i), 4c(i), 4d(i), 8a(i), 8b(i), 8c(i), 14a for anxiety/depression over time.

For Time 2 social dysfunction as a criterion variable, social dysfunction at Time 1 was not significantly related to social dysfunction at Time 2. This result indicates that social dysfunction was not consistent across time. The demographic variables explained 5% of the variance in T2 social dysfunction. Moreover, T1 job demands, T1 timing control, T1 methods control, T1 skill discretion, T1 decision authority, T1 POS, T1 supervisor support, T1 co-worker support, and T1 self-efficacy together explained just 8% of the variance in T2 social dysfunction. Only job demands at Time 1 ($\beta = 0.16$) and POS at Time 1 ($\beta = -0.21$) were statistically significant predictors of social dysfunction at Time 2. The results indicated that high T1 job demands were related to high T2 social dysfunction, supporting Hypothesis 2b. Furthermore, high T1 POS was related to low T2 social dysfunction, providing support for Hypothesis 8a(ii). Nevertheless, timing control, methods control, skill discretion, decision authority, supervisor support, co-worker support, and self-efficacy were not significantly related to social dysfunction over time. Therefore, Hypotheses 4a(ii), 4b(ii), 4c(ii), 4d(ii), 8b(ii), 8c(ii), and 14b were not supported.

In summary, minimal support was found for longitudinal main effects hypotheses. The results showed that job demands at Time 1 predicted anxiety/depression and social dysfunction at Time 2. Timing control at Time 1 predicted anxiety/depression at Time 2, but not social dysfunction. POS at Time 1 predicted social dysfunction at Time 2, but not anxiety/depression.

Longitudinal moderating effects of job control

I next hypothesised that the job control variables, including timing control, methods control, skill discretion, and decision authority, would moderate the relationships between job demands and psychological strain over time. As shown in Table 7.2 (see p.160-161), only the interaction between T1 job demands and T1 decision authority ($\beta = 0.20$) was statistically significant on T2 anxiety/depression. The moderation effects of T1 timing control, T1 methods control, and T1 skill discretion were not significant for T2 anxiety/depression, thus not supporting Hypotheses 6a(i), 6b(ii), and 6c(i).

I plotted the interaction between T1 job demands and T1 decision authority on T2 anxiety/depression using values one standard deviation above and below the mean (Aiken & West, 1991). This interaction is depicted in Figure 7.3.

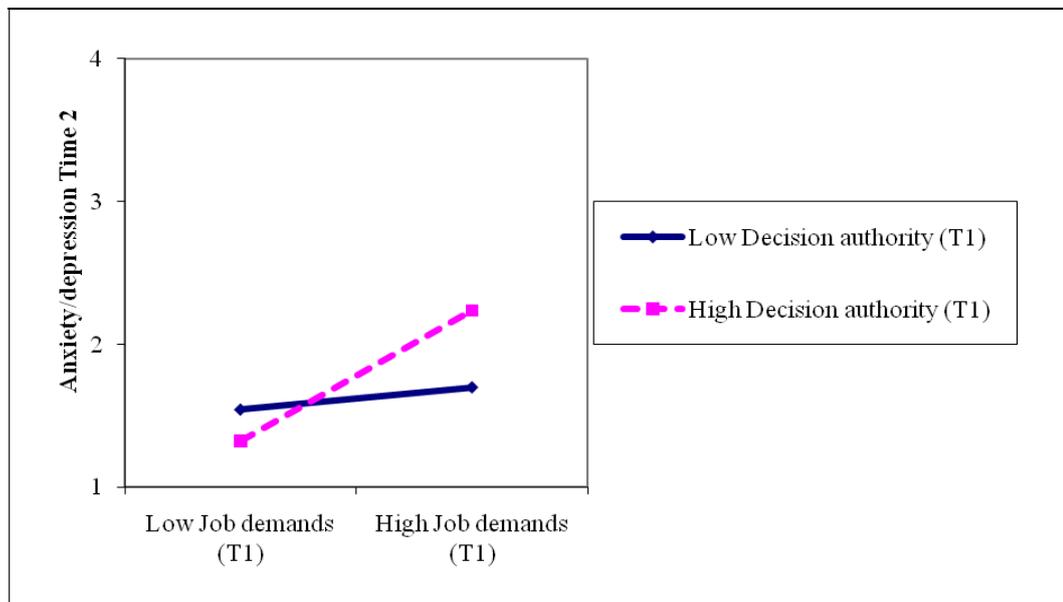


Figure 7.3. Interaction between T1 job demands and T1 decision authority on T2 anxiety/depression

Figure 7.3 illustrates that the relationship between job demands at Time 1 and anxiety/depression at Time 2 was positive for respondents with both high and low decision authority at Time 1, but the relationship was less pronounced for respondents with low decision authority. Hence, higher job demands at Time 1 were strongly related to higher anxiety/depression at Time 2 when decision authority at Time 1 among respondents was high, but not when decision authority was low. This result contradicts Hypothesis 6d(i).

For T2 social dysfunction, the results in Table 7.2 (see p.160-161) demonstrated that none of the interaction terms of job control variables were significant, after controlling for the demographic variables. Accordingly, T1 timing control, T1 methods control, T1 skill discretion, and T1 decision authority did not moderate the impact of T1 job demands on T2 social dysfunction over time. These results fail to support Hypotheses 6a(ii), 6b(ii), 6c(ii), and 6d(ii) for social dysfunction over time.

Overall, this study did not provide support for moderating effects of the job control variables among these technical workers in Malaysia. Accordingly, the Job Demands Control (JDC) model was not replicated in this Malaysian context. Indeed, decision authority moderated the relationships between job demands and anxiety/depression over time, but in the opposite direction with the JDC model.

Longitudinal moderating effects of social support

I tested the two-way interaction between job demands and social support (i.e. POS, supervisor support, and co-worker support) over time. As mentioned previously, I also examined the three-way interaction between job demands, job control variables (i.e. timing control, methods control, skill discretion, and decision authority), and social support variables (i.e. POS, supervisor support, and co-worker support) over time, following the JDCS model.

The results in Table 7.2 (see p.160-161) showed that none of the two-way interaction effects were significant for anxiety/depression and social dysfunction over time. These results indicate that POS, supervisor support, and co-worker support did not moderate the impact of job demands on anxiety/depression and social dysfunction over time. Therefore, these results fail to support Hypotheses 10a, 10b, and 10c. Likewise, the three-way interaction effects were also not significant for both anxiety/depression and social dysfunction. These results also fail to support Hypotheses 12a, 12b, and 12c. Consequently, the longitudinal analyses did not provide support for the JDCS model among these technical workers in Malaysia.

It was concluded that the longitudinal moderation analyses did not provide support for the moderating effects of POS, supervisor support and co-worker

support over the six-month period. The results also fail to support the JDCS model among these technical workers in Malaysia over time.

Longitudinal moderating effects of self-efficacy

I next tested the longitudinal moderation effect of self-efficacy on the relationships between job demands and the psychological strain components (i.e. anxiety/depression and social dysfunction). For T2 anxiety/depression as the criterion variables, the results in Table 7.2 (see p.160-161) showed that T1 self-efficacy moderated the relationships between T1 job demands and T2 anxiety/depression. Similarly, the results also showed that there was a statistically significant longitudinal interaction of T1 job demands x T1 self-efficacy on T2 social dysfunction. Therefore, T1 self-efficacy moderated the impact of T1 job demands on T2 anxiety/depression and T2 social dysfunction over time.

I plotted the significant interaction effects using values one standard deviation above and below the mean (Aiken & West, 1991). The interactions effects are illustrated in Figures 7.4 and 7.5.

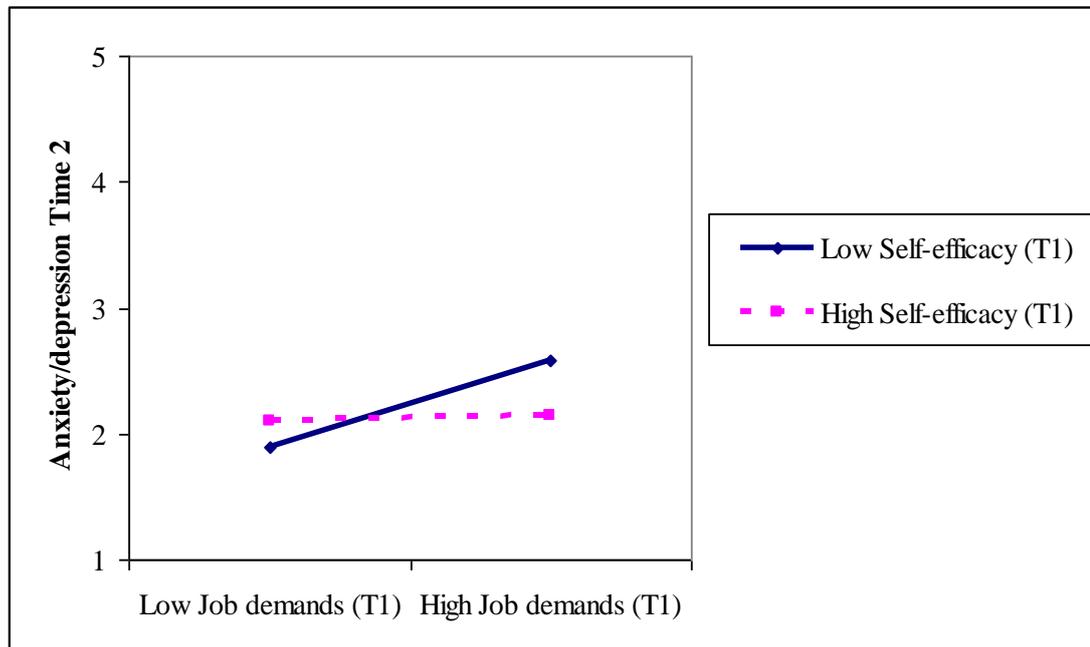


Figure 7.4. Interaction between T1 job demands and T1 self-efficacy on T2 anxiety/depression

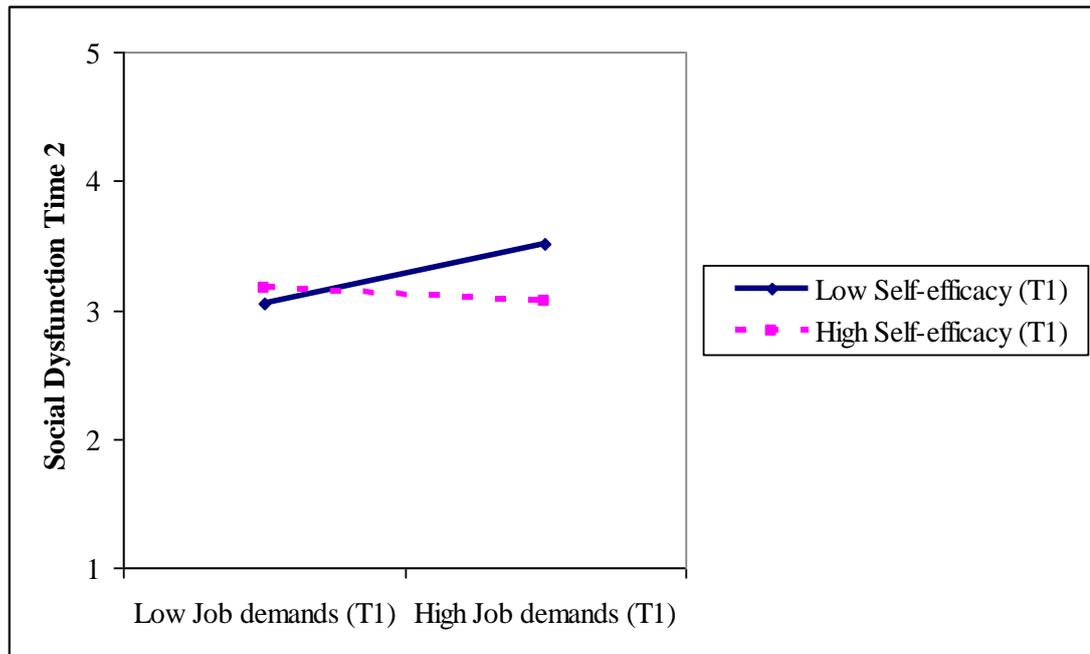


Figure 7.5. Interaction between T1 job demands and T1 self-efficacy on T2 social dysfunction

Figure 7.4 illustrates the interaction between T1 job demands and T1 self-efficacy on T2 anxiety/depression. The figure demonstrates a positive relationship between T1 job demands and T2 anxiety/depression among those who reported lower T1 self-efficacy, whereas there was no trend among respondents reporting higher T1 self-efficacy. In other words, T1 job demands were related to T2 anxiety/depression only when T1 self-efficacy among respondents was low, but not when T1 self-efficacy was high. These results support Hypothesis 16a. Figure 7.5 shows the interaction between T1 job demands and T1 self-efficacy on T2 social dysfunction. This figure has a similar pattern with Figure 7.4, thus supporting Hypothesis 16b.

Overall, the longitudinal analyses provide support for the hypothesis of the moderating effects of self-efficacy over time. Self-efficacy moderated the impact of job demands on anxiety/depression and social dysfunction over the six-month period.

Longitudinal main effects of psychological strain

I also assessed the longitudinal main effect of anxiety/depression and social dysfunction on job satisfaction, affective commitment, turnover intentions, and job performance. I controlled the effects of demographic variables which had significant relationships with the criterion variables. Specifically, I controlled for age, gender and position in the prediction of job satisfaction; position in the prediction of affective commitment; age and gender in the prediction of job performance; and gender, marital status and education level in the prediction of turnover intentions. I conducted a separate regression analysis for each criterion variable. Additionally, I control the criterion variable at Time 1 for each regression model, thus going beyond mere cross-sectional analyses (Zapf, Dormann, & Frese, 1996).

Job satisfaction

Table 7.3 displays the longitudinal analyses of main effects of the psychological strain components on job satisfaction.

Table 7.3. Longitudinal hierarchical regression analysis of T2 job satisfaction on T1 psychological strain

Predictor at Time 1	Step 1	Step 2	Step 3
Job satisfaction T1	0.14*	0.13	0.13
Age		0.05	0.04
Gender		0.04	0.05
Position		-0.05	-0.05
Anxiety/depression T1			-0.08
Social dysfunction T1			0.03
R ²	0.02	0.03	0.03
ΔR ²	0.02	0.01	0.01
F change	4.91*	0.45	0.81
Df	1, 243	3, 240	2, 238

Note. n = 245. *p<0.05; **p<0.01; ***p<0.001; Estimates are standardised regression coefficients.

Job satisfaction at Time 1 explained 2% of the variance in job satisfaction at Time 2. Nevertheless, the results show that anxiety/depression and social dysfunction at

Time 1 did not significantly predict job satisfaction at Time 2, failing to support Hypotheses 18a and 18b.

Affective commitment

Table 7.4 presents the longitudinal analyses of main effects of the psychological strain components on affective commitment. Affective commitment at Time 1 explained 3% of the variance in affective commitment at Time 2, after controlling for the demographic variable of position. The results illustrated that anxiety/depression and social dysfunction at Time 1 did not significantly predict affective commitment at Time 2, failing to support Hypotheses 22a and 22b.

Table 7.4. Longitudinal hierarchical regression analysis of T2 affective commitment on T1 psychological strain

Predictor at Time 1	Step 1	Step 2	Step 3
Affective commitment T1	0.18**	0.18**	0.16
Position		-0.04	-0.04
Anxiety/depression T1			-0.08
Social dysfunction T1			0.04
R ²	0.03	0.03	0.04
ΔR ²	0.03	0.01	0.01
F change	8.22**	0.44	0.78
Df	1, 243	1, 242	2, 240

Note n = 245. *p<0.05; **p<0.01; Estimates are standardised regression coefficients.

Turnover intentions

Table 7.5 shows the results of longitudinal main effects of the psychological strain components on turnover intentions. Turnover intentions at Time 1 explained 7% of the variance in turnover intentions at Time 2. However, anxiety/depression and social dysfunction at Time 1 did not significantly predicted turnover intentions at Time 2, failing to support Hypotheses 26a and 26b.

Table 7.5. Longitudinal hierarchical regression analysis of T2 turnover intentions on T1 psychological strain

Predictor at Time 1	Step 1	Step 2	Step 3
Turnover intentions T1	0.26**	0.25**	0.22
Gender		-0.19**	-0.22
Marital status		0.14*	0.15
Education level		-0.04	-0.03
Anxiety/depression T1			0.09
Social dysfunction T1			0.08
R ²	0.07	0.13	0.15
ΔR ²	0.07	0.07	0.02
F change	17.77**	6.00**	2.04
Df	1, 243	3, 240	2, 238

Note. n = 245. *p<0.05; **p<0.01; ***p<0.001; Estimates are standardised regression coefficient

Job performance

Table 7.6 presents the longitudinal main effects of the psychological strain components on two dimensions of job performance.

Table 7.6. Longitudinal hierarchical regression analysis of T2 job performance on T1 psychological strain

Predictor at Time 1	Step 1	Step 2	Step 3
Job performance T1	0.22**	0.21**	0.16*
Age		0.09	0.10*
Gender		0.15*	0.17*
Anxiety/depression T1			-0.09
Social Dysfunction T1			-0.02
R ²	0.05	0.08	0.09
ΔR ²	0.05	0.04	0.01
F change	12.14***	4.67**	0.09
Df	2, 243	3, 240	2, 238

Note. n = 245. *p < 0.05; **p < 0.01; Estimates are standardised regression coefficient

Job performance at Time 1 explained 5% of the variance in job performance at Time 2. Anxiety/depression and social dysfunction at Time 1 did not significantly predict job performance at Time 2. These results fail to support Hypotheses 30a and 30b for job performance over time.

Overall, the results did not support the hypotheses of the longitudinal main effects of anxiety/depression and social dysfunction on any of the criterion variables over time. Thus, anxiety/depression and social dysfunction had no causal effects on job satisfaction, affective commitment, turnover intentions, and job performance.

Longitudinal main effects of job satisfaction, affective commitment, and turnover intentions on job performance

I next tested the hypotheses that job satisfaction, affective commitment, and turnover intentions would be related to job performance over time. The predictors were entered into the regression in the following four steps: (1) the criterion variable at Time 1; (2) the demographic variables of age and gender, which were significantly correlated with job performance; (3) T1 anxiety/depression and T1 social dysfunction to control the effects of these variables, and finally (4) T1 job satisfaction, T1 affective commitment, and T1 turnover intentions.

Table 7.7 displays the regression results relating to job performance as the criterion variable over time. The results show that T1 job performance explained 5% of the variance in T2 job performance. Job satisfaction, affective commitment and turnover intentions at Time 1 together, explained 3% of the variance in job performance at Time 2. Nonetheless, only T1 affective commitment was related to T2 job performance. T1 job satisfaction and T1 turnover intentions did not significantly relate to T2 job performance. These results provide support for Hypothesis 24a, but fail to support Hypotheses 20a and 28a for job performance over time.

Table 7.7. Longitudinal hierarchical multiple regression of T2 job performance on T1 job satisfaction, T1 affective commitment, and T1 turnover intentions

Predictor at Time 1	Step 1	Step 2	Step 3	Step 4
T1 Job performance	0.22**	0.21**	0.16*	0.05
Age		0.09	0.10	0.09
Gender		0.15*	0.17**	0.15*
T1 Anxiety/depression			-0.09	-0.05
T1 Social dysfunction			-0.02	-0.01
T1 Job satisfaction				0.07
T1 Affective commitment				0.14*
T1 Turnover intentions				-0.09
R ²	0.05	0.08	0.09	0.12
ΔR ²	0.05	0.04	0.01	0.03
F change	12.14***	4.70***	0.91	2.41*
Df	1, 243	3, 241	2, 239	3, 236

Note. n = 245. *p < 0.05; ** p < 0.01; ***p < 0.001; Estimates are standardised regression coefficients.

To conclude, the longitudinal analyses found that only affective commitment was significantly linked to job performance over six-month lag. Job satisfaction and turnover intentions did not predict job performance over time.

Chapter Summary

This chapter presented the results of the longitudinal main effects of work design variables on the psychological strain components. This chapter also presented the longitudinal main effects of psychological strain on job satisfaction, affective commitment, turnover intentions, and job performance. The longitudinal main effects of job satisfaction, affective commitment, and turnover intentions on job performance were also presented. Moreover, the longitudinal moderating effects of job control, social support, and self-efficacy in the relationships between job demands and the psychological strain components were presented.

The results suggest that the main and moderating hypotheses were only partially supported. Job demands consistently linked to anxiety/depression and social

dysfunction over time. Timing control affected anxiety/depression and POS affected social dysfunction over time. Nevertheless, anxiety/depression and social dysfunction did not affect job satisfaction, affective commitment, turnover intentions, and job performance over time. In addition, job satisfaction and turnover intentions did not affect job performance over time. Affective commitment was associated with job performance over time.

The results did not support the moderating effect of job control over time. Accordingly, the longitudinal analyses did not support the JDC model among these technical workers in Malaysia. In fact, this study provides evidence that job control (e.g. decision authority) aggravated the impact of job demands on anxiety/depression over time. In addition, the longitudinal analyses found that POS, supervisor support, and co-worker support did not moderate the impact of job demands on anxiety/depression and social dysfunction over time. The three-way interactions between job demands, social support, and job control variables on the psychological strain variables were not supported. Hence, the results did not support the JDCS model in the longitudinal analyses. Self-efficacy moderated the impact of job demands on anxiety/depression and social dysfunction over time.

In Chapter 8, I present the research findings for the cross-sectional mediation analyses.

CHAPTER 8

CROSS-SECTIONAL ANALYSES OF MEDIATION EFFECTS

Chapter Overview

This chapter presents the cross-sectional analyses concerning the mediation hypotheses. There are three major sections: (a) preconditions for mediation, (b) the analytical strategy to test the mediation hypotheses, and (c) the results of the cross-sectional analyses of the mediation effects at Times 1 and 2.

Precondition for Mediation Testing

When using structural equation modeling (SEM) to analyse mediation effects, previous researchers have suggested that mediation inferences are justified by the $X \rightarrow M$ and $M \rightarrow Y$ paths being significant (e.g., Kenny, Kashy, & Bolger, 1998; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Thus, the essential conditions in establishing mediation are (1) showing that the predictor (X) variable is related to the mediator (M) and (2) showing that the mediator (M) is related to the criterion variable (Y).

Baron and Kenny (1986) argued that the relationship between predictor (X) and criterion (Y) must also be significant to allow testing the mediation effects. However, researchers have recently argued that this condition is not necessary. Two reasons why some researchers have suggested omitting the $X \rightarrow Y$ precondition (Mathieu & Taylor, 2006) are, firstly that the confounding, suppression and interactive effects could attenuate the overall $X \rightarrow Y$ relationship. The effect of confounding variables implies the presence of non-linear relationships, which violate an assumption of testing indirect or mediated relations (Mathieu & Taylor, 2006). Secondly, the mediation effects might reduce the total $X \rightarrow Y$ relationship, when opposite signed direct and indirect effects are present (e.g., when X and M are both positively related to Y, yet X and M are negatively related). The common thread through this position is that other variables, including perhaps the mediator, may serve to contaminate the total $X \rightarrow Y$ relationship.

In the current study, I applied path analysis using SEM to test the mediation hypotheses. For SEM approach, the focal or baseline paradigm for mediation is used the full mediation model (James & Brett, 1984; James, Mulaik, & Brett, 2006). This is the the most basic and parsimonious mediation model and is shown in Figure 8.1, where x is the predictor, M is the mediator, and Y is the criterion.

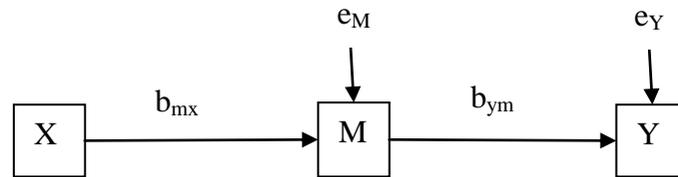


Figure 8.1. Full mediation model

Analytical Strategy

I tested the hypotheses by conducting a series of structural equation modeling (SEM) analyses using AMOS 18 with maximum likelihood estimation, as this approach provides a test of the significance of the indirect effects (James, et al., 2006; MacKinnon, et al., 2002). SEM techniques have long been advocated as preferable to regression techniques for testing mediational relationships because they permit modelling of both measurement and structural relationships and yield overall fit indices (Baron & Kenny, 1986; James, et al., 2006).

In order to gauge model fit, I examined the chi-square test (χ^2), the normed chi-square value (ratio of chi-square to df; χ^2/df), the root mean square error of approximation (RMSEA), the root mean square residual (RMR), the comparative fit index (CFI) and the goodness-of-fit index (GFI). To gauge the mediation effects, I report the total effect, indirect effect and direct effect statistics for each of the mediation routes. The total effect is the degree to which a change in the predictor variable is related with the criterion variable ($X \rightarrow Y$). The indirect effect is the degree to which a change in the predictor variable produces a change in the criterion variable through the mediator variable ($X \rightarrow M \rightarrow Y$). The direct effect is the degree to which a change in the predictor variable is directly related with the criterion variable without going through the mediator variable. In other words, the direct effect is a partial correlation between $X \rightarrow Y$ after controlling for M . The sum of the direct and indirect effects equals the total effect. Mathieu and Taylor

(2006) suggested several useful guidelines to determine the nature of the mediation. If both the indirect effect and direct effect are significant, this reveals a partial mediation model. If the indirect effect and total effect are significant but the direct effect is not, this signifies full mediation model. I applied this guideline to estimate whether the mediation was full or partial.

To test the significance level of each effect, I used the bootstrapping method (with $n = 1000$ bootstrap resampling) and bias-corrected confidence intervals (see Cheung & Lau, 2008; Preacher & Hayes, 2008). I estimated 95% confidence intervals for the indirect effects. Bootstrapping is a nonparametric resampling procedure that generates an empirical approximation of the sampling distribution of a statistic from the available data. More specifically, the bootstrapping sampling distributions of the indirect effects are empirically generated by taking a sample (with replacement) of size n from the full data set and calculating the indirect effects in the resamples. Bollen and Stine (1990) showed that bootstrapping methods could be very useful in studying the sampling variability of estimates of indirect effects in mediation models. The bootstrapping method for mediation is important for at least two reasons (MacKinnon, et al., 2007). First, this method provides a general way to test significance and confidence intervals in a wide variety of situations. Second, the methods do not require many assumptions – which is likely to make them accurate.

Testing the Overall Mediation Model

Figure 8.2 presents the original overall mediation model analysed in this study. The overall model has two parts: (1) Model A posits that work design is related to strain, which in turn is related to the work attitude variables (i.e. job satisfaction, affective commitment, and turnover intentions) and (2) Model B posits that psychological strain is related to the work attitude variables, which in turn are associated with job performance.

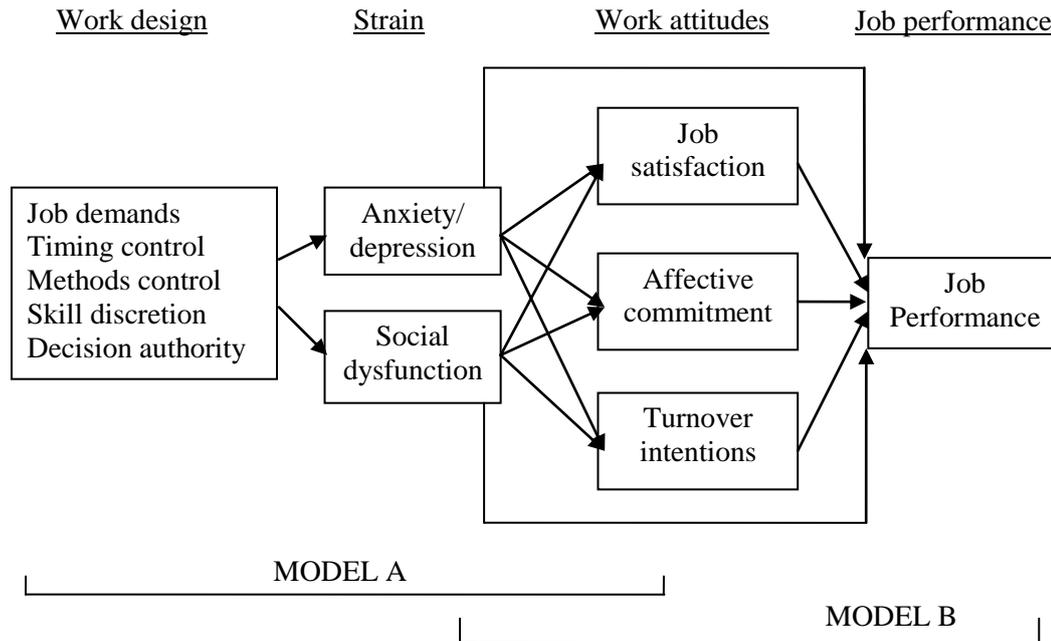


Figure 8.2. Hypothesised overall mediation model

Model fit for the overall model

Before I examined the specific mediation hypotheses, I tested the model fit for the overall mediation model in Figure 8.2 at both Times 1 and 2. My strategy in arriving at a final model of the data involved (a) testing the fit of the model as initially specified in Figure 8.2, (b) examining modification indices and path coefficients to decide whether and how to modify the model if necessary, and (c) testing the fit of the final model.

The initially specified model in Figure 8.2 yielded a $\chi^2/df_{(24, n = 429)} = 14.38$, $p < 0.01$; RMSEA = 0.18; RMR = 0.08; CFI = 0.80; and GFI = 0.87 at Time 1, and $\chi^2/df_{(24, n = 245)} = 10.89$, $p < 0.01$; RMSEA = 0.20; RMR = 0.12; CFI = 0.76; and GFI = 0.84 at Time 2. These fit indices were not acceptable at both times for the original overall mediation model. Accordingly, I modified the original model based on the modification indices.

At Time 1, the modification indices suggested that six direct paths would improve the model fit. Each added pathway statistically improved the fit of the model (as indicated by the modification index for that path) and also made both logical and

conceptual sense, given the underlying theory of the model. The new pathways added in the overall mediation model at Time 1 were direct paths from skill discretion to affective commitment, job satisfaction, and job performance, a direct path from decision authority to job satisfaction, and direct paths from job demands and methods control to job performance. The modified overall model at Time 1 indicated a reasonable fit to the data (see Table 8.1). The parameter estimates for the modified overall model at Time 1 can be seen in Appendix U.

Table 8.1. Model fit indices for overall mediation model

Model	χ^2	Df	χ^2/df	RMR	RMSEA	CFI	GFI
Time 1	28.18	14	2.0	0.02	0.05	0.99	0.99
Time 2	24.38	14	1.7	0.03	0.06	0.99	0.98

Note. n = 429 at Time 1 and 245 at Time 2

I also tested the model fit for the overall model in Figure 8.2 at Time 2. As at Time 1, the fits for the original overall model were not acceptable. Therefore, I modified the overall model based on the modification indices. The modification indices suggested that adding six direct paths would improve the model fit. The new direct pathways added in the model were four direct paths from skill discretion to affective commitment, job satisfaction, turnover intentions, and job performance, a direct path from decision authority to job satisfaction, and a direct path from job demands to job performance. The modified overall model at Time 2 indicated a reasonable fit (see Table 8.1). The parameter estimates for the modified overall model at Time 2 can be seen in Appendix V.

In summary, the results of SEM indicated that the overall mediation model at both times was acceptable after some modification of the original model. My main purpose in this analysis was to examine the specific mediation effect of each hypothesised mediator. The test of the overall mediation model in Figure 8.2 would not allow me to individually evaluate the hypothesised mediated relationships because AMOS does not report significance tests for multiple mediation effects. For this reason, I decomposed the overall mediation model into two parts following the approach suggested by Klien, Fan, and Preacher (2006). The first part is labelled Model A, which posits the mediation effects of the psychological strain components and the second part is Model B, which posits the

mediation effects of job satisfaction, affective commitment and turnover intentions. In the following sections, I present the results of the analyses for Model A and Model B at both Times 1 and 2.

Model A: Psychological Strain as a Mediator

Figure 8.3 presents the first part of the hypothesised mediation model (Model A). I hypothesised that anxiety/depression (Hypothesis 31a) and social dysfunction (Hypothesis 31b) would mediate the relationships between work design and the work attitude variables.

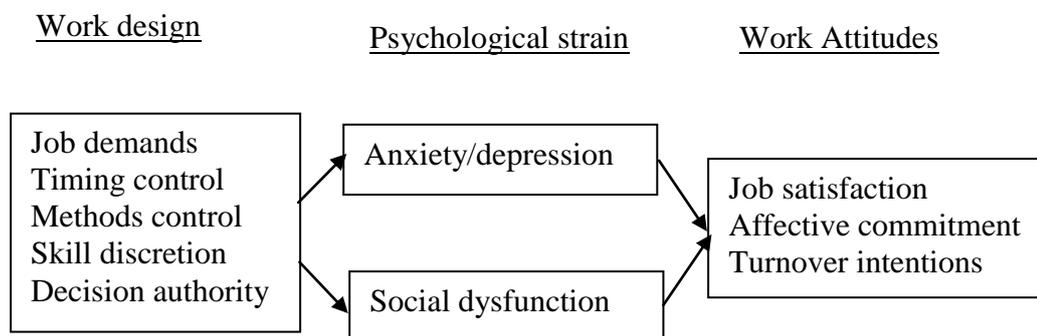
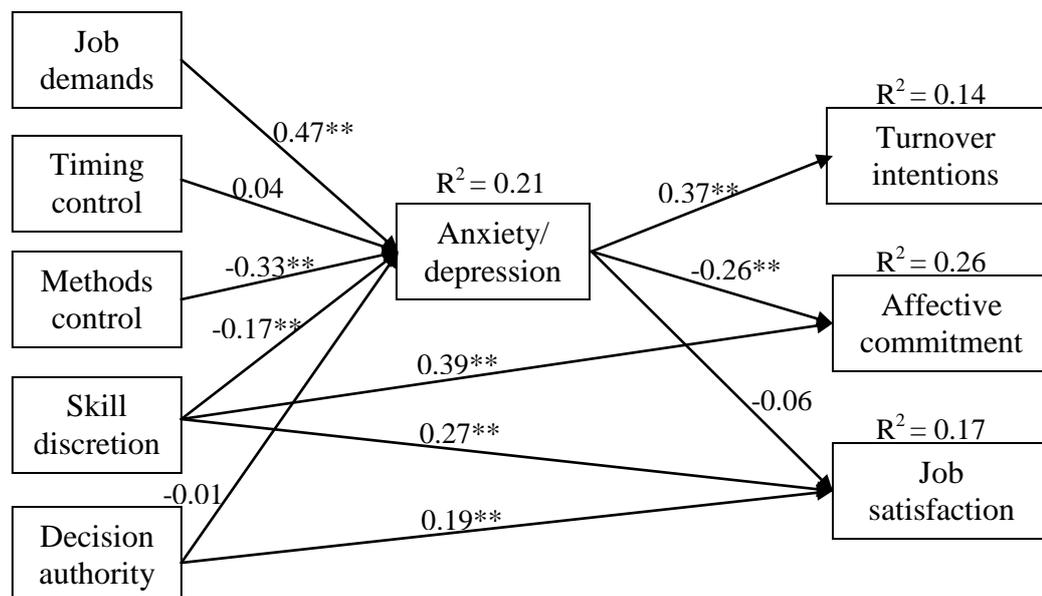


Figure 8.3. Psychological strain as a mediator (Model A)

Work design consisted of job demands and the four job control components of timing control, methods control, skill discretion, and decision authority. These variables served as the predictor variables. Psychological strain consisted of anxiety/depression and social dysfunction, which were the predicted mediator variables. Work attitudes (i.e. job satisfaction, affective commitment, and turnover intentions) served as the criterion variables. As mentioned earlier, AMOS does not report the significance tests for multiple mediation effects, thus, I decomposed Model A into two separate sub-models, one representing anxiety/depression (Model A1) and the other, social dysfunction (Model A2), as the mediator variables. I tested the model fit for each sub-model. In order to test the specific mediation effects of the mediator variables, I report the direct effects, indirect effects, and total effects for each of the individual mediation hypotheses.

Model A1 (anxiety/depression as a mediator) at Time 1

Initially, I assessed the model fit of Model A1 (with anxiety/depression as a mediator). The model fit results, with no modifications, yielded a $\chi^2/df = 14.4$; RMSEA = 0.18; RMR = 0.08; CFI = 0.79; and GFI = 0.87. These results indicate that the model did not fit the data. Accordingly, I modified the model based on the modification indices. The modified Model A1 at Time 1 presented in Figure 8.4 yielded a reasonable fit ($\chi^2_{(12, n=429)} = 28.65, p < 0.01$); $\chi^2/df = 2.4$; RMSEA = 0.06; RMR = 0.02; CFI = 0.99; and GFI = 0.99).



Note. ** $p < 0.01$

Figure 8.4. Modified Model A1 at Time 1 with standardised parameter estimates

Inspection of the modification indices suggested that three new pathways would significantly improve the fit of Model A1. Each added pathway statistically improved the fit of the model and also made logical and conceptual sense given the underlying theory. The new pathways added were a direct path from skill discretion to job satisfaction and affective commitment, and a direct path from decision authority to job satisfaction.

I also tested the direct relationships between the predictor (i.e. work design) and criterion (i.e. work attitudes) variables without the mediator variable (i.e. anxiety/depression). The results indicated that job demands and methods control were related to affective commitment and turnover intentions. Skill discretion was

related to job satisfaction, affective commitment, and turnover intentions. Decision authority was only related to job satisfaction. After I included the mediator variable, job demands, methods control, and skill discretion were significantly related to anxiety/depression. In addition, anxiety/depression was significantly related to turnover intentions and affective commitment but not job satisfaction. The following direct effects were also significant: skill discretion with affective commitment and job satisfaction, and decision authority with job satisfaction.

My main purpose in this analysis was to test the specific mediation effects of anxiety/depression in the relationships between work design and the criterion variables (i.e. job satisfaction, affective commitment, and turnover intentions). Therefore, I examined the direct effect, indirect effect, and total effect statistics in order to test these specific mediation effects. Table 8.2 presents the direct effect, indirect effect, and total effect for Model A1 at Time 1.

Table 8.2. Mediation effects of anxiety/depression at Time 1

Predictor → Mediator → Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
Job demands → A/D → Job satisfaction	.00	-.03	-.03	None
Job demands → A/D → Affective Commitment	.00	-.12**	-.12**	Full
Job demands → A/D → Turnover intentions	.00	.19**	.19**	Full
Timing control → A/D → Job satisfaction	.00	.00	.00	None
Timing control → A/D → Affective commitment	.00	-.01	-.01	None
Timing control → A/D → Turnover intentions	.00	.02	.02	None
Methods control → A/D → Job satisfaction	.00	.02	.02	None
Methods control → A/D → Affective commitment	.00	.09**	.09**	Full
Methods control → A/D → Turnover intentions	.00	-.12**	-.12**	Full
Skill discretion → A/D → Job satisfaction	.27**	.01	.28**	None
Skill discretion → A/D → Affective commitment	.39**	.04**	.43**	Partial
Skill discretion → A/D → Turnover intentions	.00	-.06**	-.06**	Full
Decision authority → A/D → Job satisfaction	.19**	.00	.19**	None
Decision authority → A/D → Affective commitment	.00	.00	.00	None
Decision authority → A/D → Turnover intentions	.00	-.01	-.01	None

Note. n = 429. * p < 0.05; ** p < 0.01; and A/D = Anxiety/depression.

The results show that six mediation effects of anxiety/depression at Time 1 were significant from the 15 mediation routes tested in this analysis. Specifically, the indirect effects of anxiety/depression were significant in the relationships between job demands and affective commitment, and between job demands and turnover intentions. These results demonstrate that anxiety/depression fully mediated the relationships between job demands and affective commitment and turnover intentions. However, anxiety/depression did not mediate the relationships between job demands and job satisfaction.

The results also show that the indirect effects of anxiety/depression were significant in the relationships between methods control and affective commitment, and turnover intentions. Anxiety/depression fully mediated the relationships between methods control and affective commitment, and turnover intentions. However, anxiety/depression did not mediate the relationships between methods control and job satisfaction.

The indirect effects of anxiety/depression were also significant in the relationships between skill discretion and affective commitment, and turnover intentions. These results reveal that anxiety/depression fully mediated the relationships between skill discretion and turnover intentions, and partially mediated the relationships between skill discretion and affective commitment. Anxiety/depression did not mediate the relationships between skill discretion and job satisfaction. The results also show that anxiety/depression did not mediate the relationships between timing control and any of the criterion variables. Also, anxiety/depression did not mediate the relationships between decision authority and any of the criterion variables.

Overall, the mediation tests for Model A1 at Time 1 indicated that anxiety/depression operated as a mediator in many of the relationships between work design and the criterion variables. Anxiety/depression mediated the impact of job demands, methods control, and skill discretion on affective commitment and turnover intentions at Time 1, but not job satisfaction. These results provide some support for Hypothesis 31a that anxiety/depression could function as a mediator in the relationships between work design and the criterion variables.

Model A2 (social dysfunction as a mediator) at Time 1

I also tested the model fit for Model A2 (with social dysfunction as a mediator). The results yielded a $\chi^2/df = 16.3$; RMSEA = 0.19; RMR = 0.08; CFI = 0.74; and GFI = 0.86, indicating that the model did not fit the data. Inspection of the modification indices suggested that five added new direct pathways would significantly improve the model fit. Figure 8.5 presents the modified Model A2 at Time 1. The modified Model A2 yielded a reasonable fit ($\chi^2_{(10, n=429)} = 27.87$, $p < 0.01$); $\chi^2/df = 2.8$; RMSEA = 0.06; RMR = 0.02; CFI = 0.98; and GFI = 0.99).

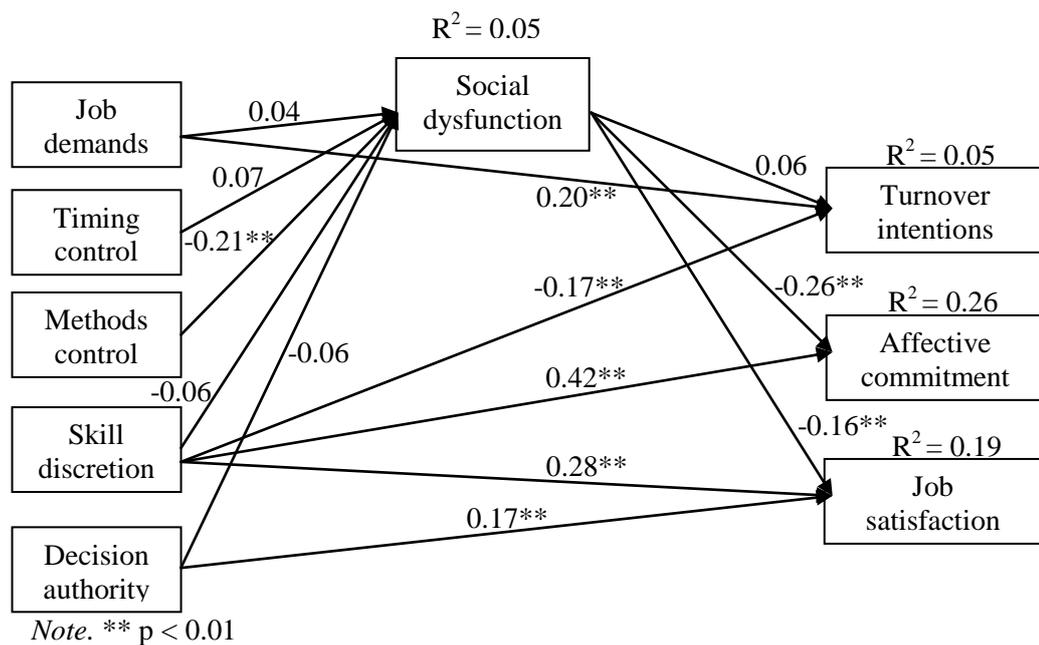


Figure 8.5. Modified Model A2 at Time 1 with standardised parameter estimates

Each added pathway statistically improved the fit of the model and also made both logical and conceptual sense given the underlying theory. The new pathways added in Model A2 were a direct path from job demands to turnover intentions, a direct path from decision authority to job satisfaction, and three direct paths from skill discretion to job satisfaction, affective commitment, and turnover intentions. Before I tested the specific mediating relationships, I test the relationships between the predictor and criterion variables without the mediator variable. The results indicated that job demands were directly related to turnover intentions. Methods control was related to job satisfaction and affective commitment. Skill

discretion was related to job satisfaction, affective commitment, and turnover intentions. Decision authority was only related to job satisfaction.

My primary aim in this analysis was to test the specific mediation effects of social dysfunction in the relationships between work design and the criterion variables at Time 1. Table 8.3 presents the direct effects, indirect effects, and total effects for Model A2 at Time 1.

Table 8.3. Mediation effects of social dysfunction at Time 1

Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
Job demands→S/D→Job satisfaction	.00	-.01	-.01	None
Job demands→S/D→Affective commitment	.00	-.01	-.01	None
Job demands→S/D→Turnover intentions	.20**	.00	.20**	None
Timing control→S/D→Job satisfaction	.00	-.01	-.01	None
Timing control→S/D→Affective commitment	.00	-.02	-.02	None
Timing control→S/D→Turnover intentions	.00	.01	.01	None
Methods control→S/D→Job satisfaction	.00	.03**	.03**	Full
Methods control→S/D→Affective commitment	.00	.05**	.05**	Full
Methods control→S/D→Turnover intentions	.00	-.01	-.01	None
Skill discretion→S/D→Job satisfaction	.28**	.01	.28**	None
Skill discretion→S/D→Affective commitment	.41**	.02	.43**	None
Skill discretion→S/D→Turnover intentions	-.17**	.00	-.17**	None
Decision authority→S/D→Job satisfaction	.17**	.01	.18**	None
Decision authority→S/D→Affective commitment	.00	.02	.02	None
Decision authority→S/D→Turnover intentions	.00	.00	.00	None

Note. $n = 429$. * $p < 0.05$; ** $p < 0.01$; and S/D = social dysfunction.

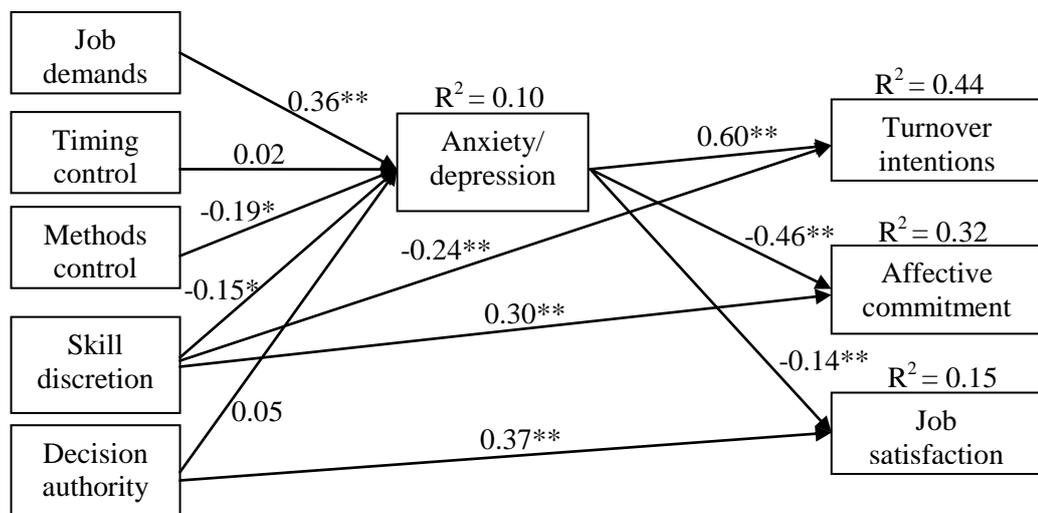
Only two mediation effects of social dysfunction were significant from the 15 mediation routes tested in this analysis. Specifically, the indirect effects of social dysfunction were significant in the relationships between methods control and job satisfaction and affective commitment. The results demonstrate that social dysfunction fully mediated the relationships between methods control and both job satisfaction and affective commitment. However, social dysfunction did not mediate the relationships between methods control and turnover intentions. The

results also show that social dysfunction did not mediate the relationships between: job demands and any of the criterion variables; timing control and any of the criterion variables; skill discretion and any of the criterion variables; and decision authority and any of the criterion variables.

To conclude, the mediation tests of Model A2 at Time 1 provide only little support for Hypothesis 31b that social dysfunction would function as a mediator in the relationships between work design and the criterion variables. Social dysfunction only mediated the relationships between methods control and the criterion variables of job satisfaction and affective commitment.

Model A1 (anxiety/depression as a mediator) at Time 2

I also examined the model fit of Model A1 at Time 2. The original Model A1 at Time 2 yielded a $\chi^2/df = 10.5$; RMSEA = 0.20; RMR = 0.13; CFI = 0.76; and GFI = 0.84, indicating poor model fit. As at Time 1, the inspection of modification indices for Model A1 suggested that three added new pathways would significantly improve the model fit. Each added pathway also made both logical and conceptual sense given the underlying theory. The new direct pathways added in the model were two direct paths from skill discretion to affective commitment and turnover intentions, and a direct path from decision authority to job satisfaction. The pattern of the model at Time 2 is fairly similar to those at Time 1. Figure 8.6 presents the modified Model A1 at Time 2.



Note. ** $p < 0.01$; * $p < 0.05$

Figure 8.6. Modified Model A1 at Time 2 with standardised parameter estimates

The Model A1 at Time 2 yielded a reasonable fit to the data ($\chi^2_{(12, n = 245)} = 30.01$, $p < 0.01$; $\chi^2/df = 2.5$; RMSEA = 0.07; RMR = 0.04; CFI = 0.98; and GFI = 0.97). As at Time 1, only job demands, methods control, and skill discretion were significantly related to anxiety/depression at Time 2. Anxiety/depression was significantly related to job satisfaction, turnover intentions, and affective commitment. Also significant were the direct links between skill discretion and affective commitment and turnover intentions, and the direct link between decision authority and job satisfaction. Similar at Time 1 analyses, I also tested the relationships between the predictor (i.e. work design) and criterion (i.e. work attitudes) variables without the mediator variable (i.e. anxiety/depression). The results showed that job demands, methods control and skill discretion were directly related to job satisfaction, affective commitment and turnover intentions. Decision authority was only related to job satisfaction.

In order to test the specific mediation effects of anxiety/depression in the relationships between work design and the criterion variables, I checked the direct effect, indirect effect, and total effect statistics. Table 8.4 presents the direct effects, indirect effects, and total effects for Model A1 at Time 2. A total of nine mediation effects for anxiety/depression were significant from the 15 mediation routes tested. The indirect effects of anxiety/depression were significant in the relationships between job demands and job satisfaction, affective commitment, and turnover intentions. Anxiety/depression fully mediated the relationships between job demands and job satisfaction, affective commitment, and turnover intentions.

The results also show that the indirect effects of anxiety/depression were significant in the relationships between methods control and job satisfaction, affective commitment, and turnover intentions. Anxiety/depression fully mediated the relationships between methods control and job satisfaction, affective commitment, and turnover intentions. The indirect effects of anxiety/depression were also significant in the relationships between skill discretion and job satisfaction, affective commitment, and turnover intentions. Anxiety/depression fully mediated the relationships between skill discretion and job satisfaction, and partially mediated the relationships between skill discretion and affective commitment and turnover intentions. However, anxiety/depression did not

mediate the relationships between timing control or decision authority with any of the criterion variables.

Table 8.4. Mediation effects of anxiety/depression at Time 2

Predictor → Mediator → Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
Job demands → A/D → Job satisfaction	.00	-.05*	-.05**	Full
Job demands → A/D → Affective Commitment	.00	-.17**	-.17**	Full
Job demands → A/D → Turnover intentions	.00	.22**	.22**	Full
Timing control → A/D → Job satisfaction	.00	-.01	-.01	None
Timing control → A/D → Affective commitment	.00	-.01	-.01	None
Timing control → A/D → Turnover intentions	.00	.01	.01	None
Methods control → A/D → Job satisfaction	.00	.03*	.03**	Full
Methods control → A/D → Affective commitment	.00	.09**	.09**	Full
Methods control → A/D → Turnover intentions	.00	-.11**	-.11**	Full
Skill discretion → A/D → Job satisfaction	.00	.02*	.02*	Full
Skill discretion → A/D → Affective commitment	.30**	.07*	.37**	Partial
Skill discretion → A/D → Turnover intentions	-.24**	-.09*	-.33**	Partial
Decision authority → A/D → Job satisfaction	.37**	-.01	.36**	None
Decision authority → A/D → Affective commitment	.00	-.02	-.02	None
Decision authority → A/D → Turnover intentions	.00	.03	.03	None

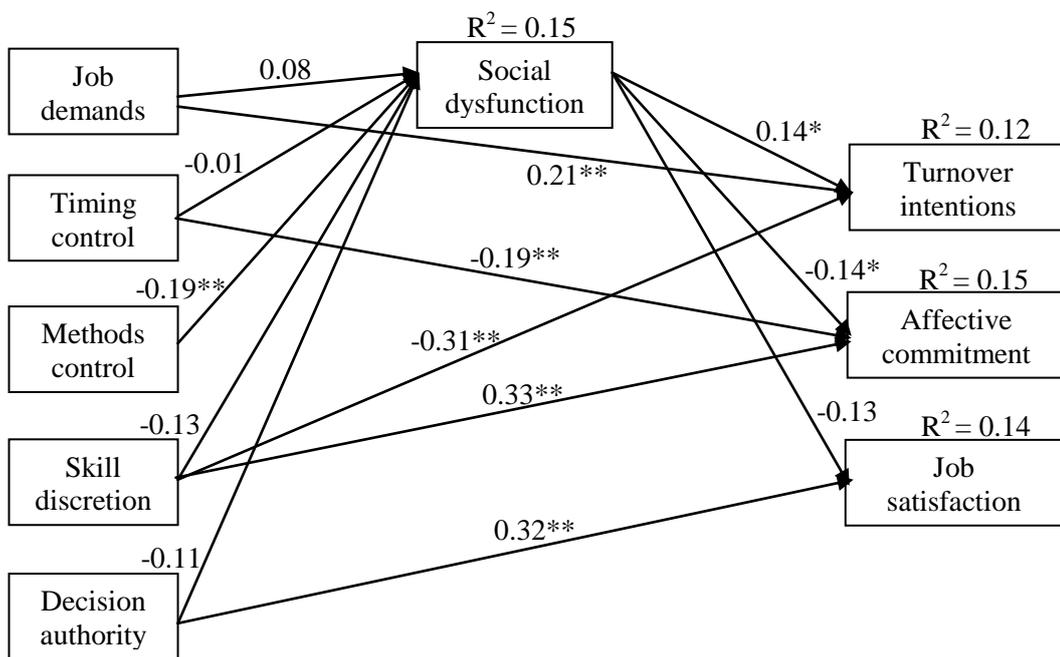
Note. N= 245. * $p < 0.05$; ** $p < 0.01$; and A/D = Anxiety/depression.

It was concluded that as at Time 1, the results of the mediation tests at Time 2 also indicated that anxiety/depression typically operated as a mediator in the relationships between work design and the criterion variables. These results provide some support for Hypothesis 31a at Time 2.

Model A2 (social dysfunction as a mediator) at Time 2

I also tested Model A2 (with social dysfunction as a mediator) at Time 2. The fit for the original Model A2 at Time 2 yielded $\chi^2/df = 13.18$; RMSEA = 0.22; RMR = 0.19; CFI = 0.65; and GFI = 0.82. These results indicate that the model fits were not acceptable. Inspection of the modification indices suggested that five added new pathways would significantly improve the model fit of the model. These

patterns were similar at those at Time 1. Each added pathway made both logical and conceptual sense given the underlying theory. The new direct pathways added were a direct path from job demands to turnover intentions, a direct path from timing control to affective commitment, direct paths from skill discretion to affective commitment and turnover intentions, and a direct path from decision authority to job satisfaction. Figure 8.7 presents the modified Model A2. The modified model yielded a reasonable fit ($\chi^2_{(10, n = 245)} = 24.14, p < 0.01; \chi^2/df = 2.4; RMSEA = 0.07; RMR = 0.04; CFI = 0.99; \text{ and } GFI = 0.98$).



Note. ** $p < 0.01$; * $p < 0.05$

Figure 8.7. Modified Model A2 at Time 2 with standardised parameter estimates

The direct relationships between the predictor and criterion variables without the mediator variable indicated that job demands were related to turnover intentions. In addition, timing control was related to affective commitment; methods control was related to job satisfaction, affective commitment, and turnover intentions; skill discretion was related to affective commitment and turnover intentions; and decision authority was related to job satisfaction.

After included the mediator variable (i.e. social dysfunction), as at Time 1 only methods control was significantly related to social dysfunction. Social dysfunction

was significantly related only to turnover intentions and affective commitment. The direct link between job demands and turnover intentions was significant. Furthermore, the direct link between timing control and affective commitment, the direct links between skill discretion and turnover intentions and affective commitment, and the direct link between decision authority and job satisfaction were also significant.

My main interest was to test the specific mediation effects of social dysfunction in the relationships between work design and the criterion variables at Time 2. Table 8.5 presents the results of the direct effect, indirect effect, and total effect of the variables.

Table 8.5. Mediation effects of social dysfunction at Time 2

Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
Job demands→S/D→Job satisfaction	.00	.01	.01	None
Job demands→S/D→Affective commitment	.00	.01	.01	None
Job demands→S/D→Turnover intentions	.21**	-.01	.20**	None
Timing control→S/D→Job satisfaction	.00	.01	.01	None
Timing control→S/D→Affective commitment	-.19**	.00	-.19**	None
Timing control→S/D→Turnover intentions	.00	-.01	-.01	None
Methods control→S/D→Job satisfaction	.00	.03*	.03*	Full
Methods control→S/D→Affective commitment	.00	.03*	.03*	Full
Methods control→S/D→Turnover intentions	.00	-.03*	-.03*	Full
Skill discretion→S/D→Job satisfaction	.00	.02	.02	None
Skill discretion→S/D→Affective commitment	.33**	.02	.35**	None
Skill discretion→S/D→Turnover intentions	-.31**	-.02	-.33**	None
Decision authority→S/D→Job satisfaction	.32**	.02	.34**	None
Decision authority→S/D→Affective commitment	.00	.01	.01	None
Decision authority→S/D→Turnover intentions	.00	-.02	-.02	None

Note. N= 245. * $p < 0.05$; ** $p < 0.01$; and S/D = social dysfunction.

Only three mediation effects of social dysfunction were significant from 15 mediation routes tested in this study. Specifically, the indirect effects of social dysfunction were significant in the relationships between methods control and job

satisfaction, affective commitment, and turnover intentions. Social dysfunction fully mediated the relationships between methods control and job satisfaction, affective commitments, and turnover intentions, but did not mediate the relationships between job demands, timing control, skill discretion, and decision authority, and any of the criterion variables.

To conclude, as at Time 1 the results of the mediation tests of Model A2 at Time 2 provide only little support for Hypothesis 31b. Social dysfunction only mediated the relationships between methods control and the criterion variables of job satisfaction, affective commitment, and turnover intentions.

Model B: Job Satisfaction, Affective Commitment, and Turnover Intentions as Mediators

Figure 8.8 presents the second part of the hypothesised mediation model (Model B). I hypothesised that job satisfaction (Hypothesis 33a), affective commitment (Hypothesis 33b), and turnover intentions (Hypothesis 33c) would mediate the relationships between the psychological strain dimensions and job performance.

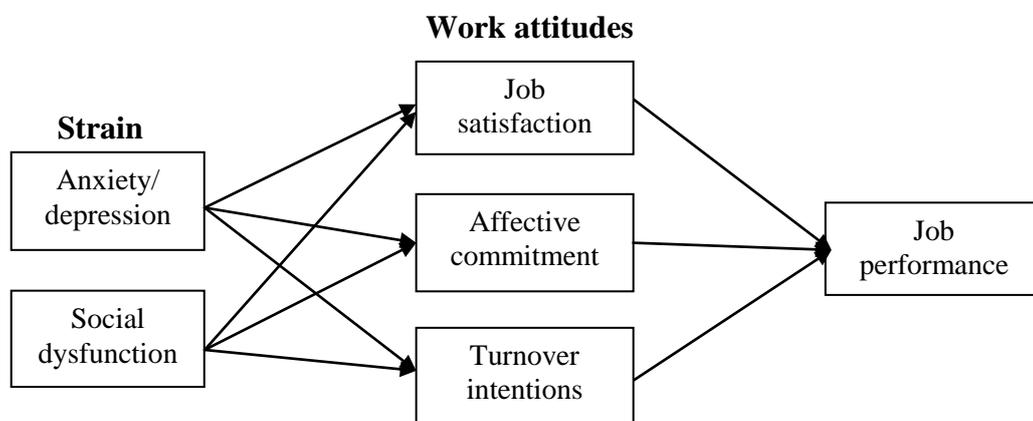


Figure 8.8. Job satisfaction, affective commitment, and turnover intentions as mediators (Model B)

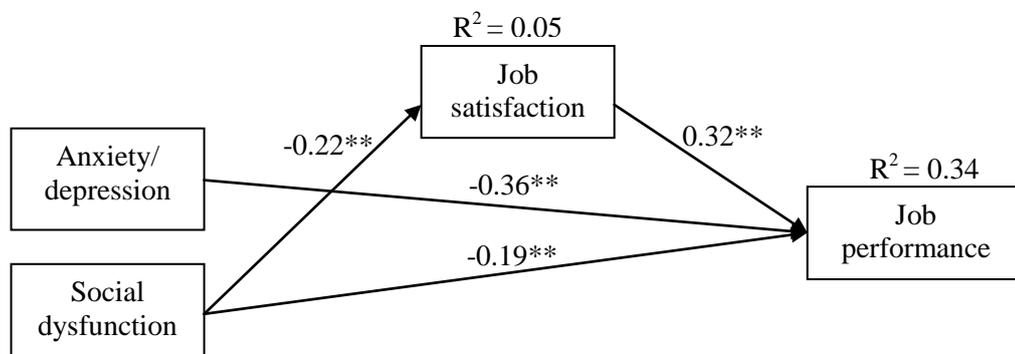
As in the previous analyses, I decomposed the model into three sub-models that allowed me to separately test each of the specific hypothesised mediated relationships. The three sub-models were (a) the mediator effects of job satisfaction (Model B1), (b) the mediator effects of affective commitment (Model

B2), and (c) the mediator effects of turnover intentions (Model B3). Three separate mediation models were examined because it was not possible to simultaneously test the specific mediation hypotheses by examining the overall model presented in Figure 8.8. I tested the model fit for each sub-model before I tested the specific mediation effects.

In order to examine the specific mediation effects of job satisfaction, affective commitment, and turnover intentions, I checked the direct effect, indirect effect, and total effect statistics. The hypotheses were tested at both Times 1 and 2. Additionally, I examined the relationships between the psychological strain variables and job performance variables without the mediator variables (i.e. work attitudes) at both times. The results indicated that both of the psychological strain variables (i.e. anxiety/depression and social dysfunction) were directly related to job performance.

Model B1 (job satisfaction as a mediator) at Time 1

I examined the fit statistics for each sub-model before I examined the specific mediation effects at Time 1. For Model B1 (with job satisfaction as a mediator), the results of the original model yielded a $\chi^2_{(2, n = 429)} = 53.53$, $p < 0.01$; RMSEA = 0.35; RMR = 0.09; CFI = 0.52; and GFI = 0.90, indicating that the model fit was not acceptable. The modification indices suggested that two new direct pathways and one direct path deleted would significantly improve the model fit. These modifications made both logical and conceptual sense given the underlying theory. Figure 8.9 presents the modified Model B1 at Time 1.



Note. ** $p < 0.01$

Figure 8.9. Modified Model B1 at Time 1 with standardised parameter estimates

The new direct pathways added in the model were direct paths from anxiety/depression and social dysfunction to job performance. The direct path deleted in the model was the direct path from anxiety/depression to job satisfaction, where the path coefficient was not significant. The modified model yielded a reasonable fit ($\chi^2_{(1, n = 429)} = 2.57, p > 0.05; \chi^2/df = 2.5; RMSEA = 0.06; RMR = 0.02; CFI = 0.99; \text{ and } GFI = 0.99$).

My main purpose in this analysis was to examine the specific mediation effects of job satisfaction in the relationships between the psychological strain dimensions and job performance. To examine the specific mediation effect of job satisfaction, I checked the direct effect, indirect effect, and total effect statistics. Table 8.6 presents the direct effects, indirect effects, and total effects for Model B1 (job satisfaction as a mediator) at Time 1.

Table 8.6. Mediation effects of job satisfaction at Time 1

Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
A/D→JS→Job performance	-.36**	.00	-.36**	None
S/D→JS→Job performance	-.19**	-.07**	-.26**	Partial

Note. A/D = Anxiety/depression; S/D = social dysfunction; JS = job satisfaction. * $p < 0.005$; ** $p < 0.001$; $n = 429$.

The indirect effect of job satisfaction was significant in the relationship between social dysfunction and job performance. These results indicate that job satisfaction partially mediated the relationships between social dysfunction and job performance, thus supporting Hypothesis 33a(i). However, the indirect effect of job satisfaction was not significant in the relationship between anxiety/depression and job performance, indicating that job satisfaction did not mediate the impact of anxiety/depression on job performance. This result fails to support Hypothesis 33a(ii).

Model B2 (affective commitment as a mediator) at Time 1

For Model B2 (with affective commitment as a mediator), the results yielded $\chi^2_{(2, n = 429)} = 27.96, p < 0.01; RMSEA = 0.25; RMR = 0.05; CFI = 0.85; \text{ and } GFI = 0.94$, indicating poor model fit. The modification indices suggested two added

new direct pathways would significantly improve the model fit. Figure 8.10 presents the modified Model B2 at Time 1.

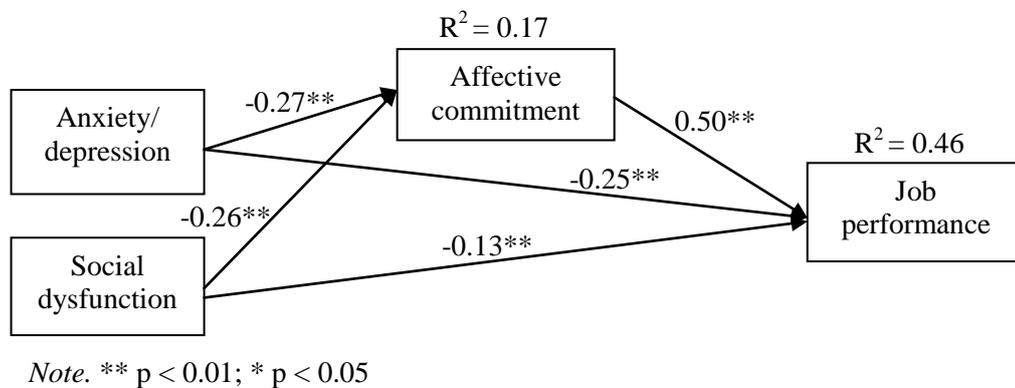


Figure 8.10. Modified Model B2 at Time 1 with standardised parameter estimates

The new direct paths added were direct links from anxiety/depression and social dysfunction to job performance. The modified Model B2 also yielded a reasonable fit ($\chi^2_{(1, n = 429)} = 2.30$, $p > 0.01$; $\chi^2/df = 2.3$; RMSEA = 0.06; RMR = 0.01; CFI = 0.99; and GFI = 0.99).

The main purpose in this analysis was to investigate the specific mediation effect of affective commitment in the relationships between the psychological strain dimensions and job performance. Hence, I also checked the direct effect, indirect effect, and total effect statistics. Table 8.7 presents the results for of the mediation effects of affective commitment at Time 1.

Table 8.7. Mediation effects affective commitment at Time 1

Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
A/D→Affective→Job performance	-.25**	-.14**	-.39**	Partial
S/D→Affective→Job performance	-.13**	-.13**	-.26**	Partial

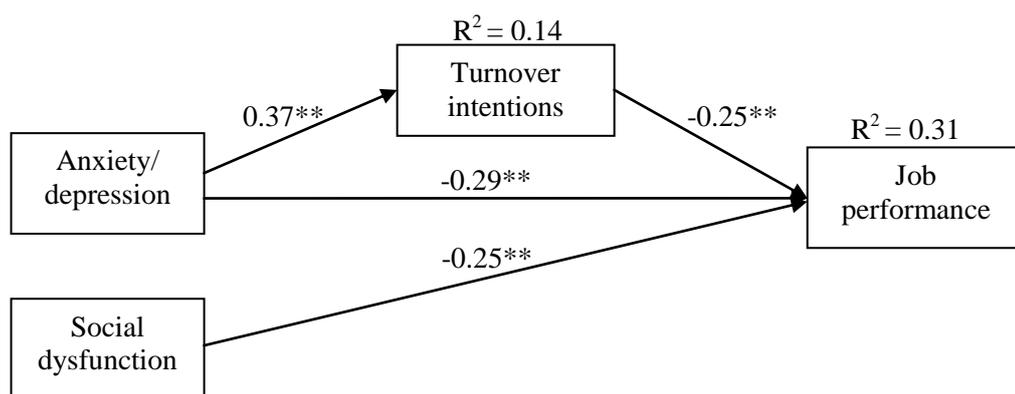
Note. A/D = Anxiety/depression, S/D = social dysfunction; Affective = affective commitment. **p < 0.001; n = 429.

All the mediation routes tested in this study were significant. The indirect effect of affective commitment was significant in the relationship between anxiety/depression and job performance, indicating that affective commitment

partially mediated the effect of anxiety/depression on job performance. Furthermore, the indirect effect of affective commitment was also significant in the relationships between social dysfunction and job performance. This result also shows that affective commitment partially mediated the association between social dysfunction and job performance. Overall, these results support Hypotheses 33b(i) and 33b(ii).

Model B3 (turnover intentions as a mediator) at Time 1

For Model B3 (with turnover intentions as a mediator), the results yielded $\chi^2_{(2, n = 429)} = 44.93$, $p < 0.01$; RMSEA = 0.32; RMR = 0.07; CFI = 0.62; and GFI = 0.91, indicating that the model fit was not acceptable. The modification indices suggested that two new direct pathways added and one direct path deleted would improve the model fit. These modifications made both logical and conceptual sense given the underlying theory. The new direct pathways added were direct paths from anxiety/depression and social dysfunction to job performance. The deleted direct path was a direct path from social dysfunction to turnover intentions, where the path coefficient was not significant. Figure 8.11 presents the modified Model B3 at Time 1. The modified model yielded a reasonable fit ($\chi^2_{(1, n = 429)} = 0.01$, $p > 0.01$; $\chi^2/df = 0.01$; RMSEA = 0.00; RMR = 0.00; CFI = 1.00; and GFI = 1.00).



Note. ** $p < 0.01$; * $p < 0.05$

Figure 8.11. Modified Model B3 at Time 1 with standardised parameter estimates

As in the previous analyses, the main purpose in this analysis was to test the specific mediation effects of turnover intentions in the relationships between the

psychological strain dimensions and job performance. I checked the direct effect, indirect effect, and total effect statistics in order to examine the mediation effect. Table 8.8 presents the results of this analysis at Time 1.

Table 8.8. Mediation effects of turnover intentions at Time 1

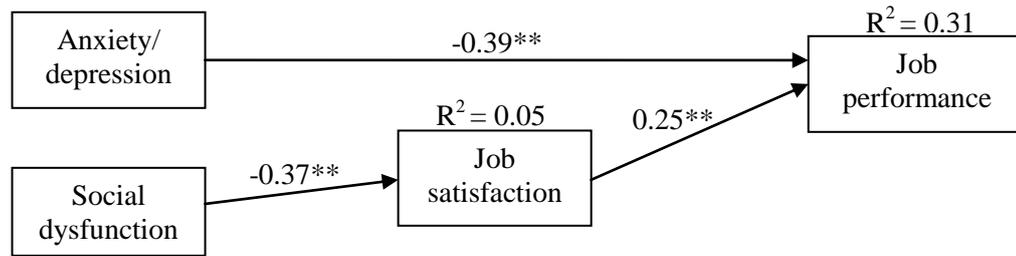
Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
A/D→Turnover→Job performance	-.29**	-.09**	-.38**	Partial
S/D→Turnover→Job performance	-.25**	.00	-.25**	None

Note. A/D = Anxiety/depression, S/D = social dysfunction; Turnover = turnover intentions. ** $p < 0.001$; $n = 429$.

Only one out of two mediation routes tested in this study were significant. Specifically, the indirect effect of turnover intentions was significant in the relationship between anxiety/depression and job performance. That is, turnover intentions partially mediated the relationships between anxiety/depression and job performance, thus supporting Hypothesis 33c(i). However, turnover intentions did not mediate the relationship between social dysfunction and job performance. This result fails to support Hypothesis 33c(ii).

Model B1 (job satisfaction as a mediator) at Time 2

I also assessed the mediation effects of job satisfaction in the relationships between the psychological strain dimensions and job performance at Time 2. The results for original Model B1 at Time 2 yielded a $\chi^2_{(2, n = 245)} = 36.91$, $p < 0.01$; RMSEA = 0.38; RMR = 0.10; CFI = 0.39; and GFI = 0.89, indicating poor model fit. Inspection of modification indices suggested that one direct path added and one deleted in the model would significantly improve the model fit. This modification made both logical and conceptual sense given the underlying theory. The new direct pathway added was a direct path from anxiety/depression to job performance and the deleted path was the direct link between anxiety/depression and job satisfaction. The modified Model B1 at Time 2 is exhibited in Figure 8.12. The modified model yielded a reasonable fit ($\chi^2_{(2, n = 245)} = 5.61$, $p > 0.05$; $\chi^2/df = 2.8$; RMSEA = 0.08, RMR = 0.02, CFI = 0.97, and GFI = 0.99).



Note. ** $p < 0.01$

Figure 8.12. Modified Model B1 at Time 2 with standardised parameter estimates

As at Time 1, the main aim in this analysis was to investigate the specific mediation effects of job satisfaction in the relationships between the psychological strain dimensions and job performance at Time 2. Hence, I checked the direct effect, indirect effect, and total effect statistics at Time 2. These results are presented in Table 8.9.

The results at Time 2 were generally similar with those at Time 1. At Time 2, one out of two mediation routes tested in this study was significant. Specifically, the indirect effect of job satisfaction was significant in the relationship between social dysfunction and job performance. This result shows that job satisfaction fully mediated the relationship between social dysfunction and job performance, thus supporting Hypothesis 33a(i). However, job satisfaction did not mediate the relationship between anxiety/depression and job performance. This result fails to support Hypotheses 33a(ii) at Time 2.

Table 8.9. Mediation effects of job satisfaction at Time 2

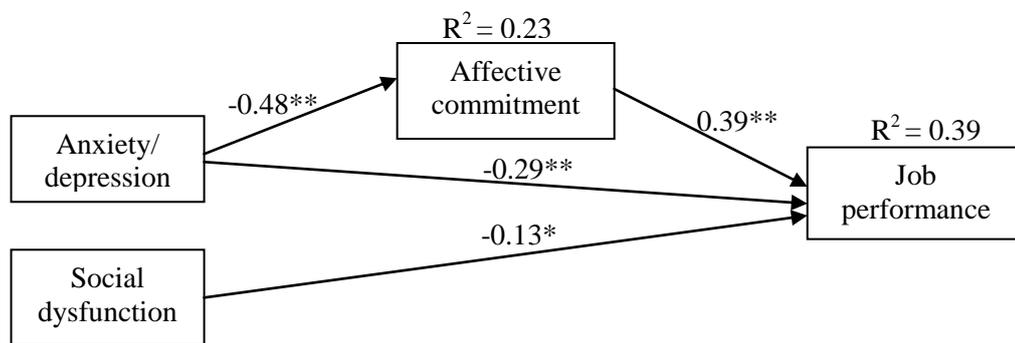
Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
A/D→JS→Job performance	-.48**	.00	-.48**	None
S/D→JS→Job performance	.00	-.06**	-.06**	Full

Note. A/D = Anxiety/depression; S/D = social dysfunction; JS = Job satisfaction. ** $p < 0.001$; $n = 245$.

Model B2 (affective commitment as a mediator) at Time 2

I also tested Model B2 at Time 2 and the original Model B2 yielded $\chi^2_{(2, n = 245)} = 17.38$, $p < 0.01$; RMSEA = 0.26; RMR = 0.06; CFI = 0.83; and GFI = 0.94,

indicating poor model fit. The modification indices suggested that two direct paths added and one direct path deleted in the model would significantly improve the model fit. Specifically, I added the direct pathways from anxiety/depression and social dysfunction to job performance and deleted the direct path from social dysfunction to affective commitment. These modifications made both logical and conceptual sense given the underlying theory. Figure 8.13 exhibits the modified Model B2 at Time 2. The modified model yielded a reasonable fit ($\chi^2_{(1, n = 245)} = 2.00, p > 0.05; \chi^2/df = 1.9; RMSEA = 0.06; RMR = 0.01; CFI = 0.99; \text{ and } GFI = 0.99$).



Note. ** $p < 0.01$; * $p < 0.05$

Figure 8.13. Modified Model B2 at Time 2 with standardised parameter estimates

As the main purpose in this analysis was to examine the specific mediation effects of affective commitment in the relationships between the psychological strain dimensions and job performance at Time 2, I checked the direct effect, indirect effect, and total effect statistics. The direct effects, indirect effects, and total effects for Model B2 at Time 2 are presented in Table 8.10. Only one out of two mediation routes tested in this study was significant for Model B2 at Time 2. Consistent with Time 1, the indirect effect of affective commitment was significant in the relationship between anxiety/depression on job performance. This result demonstrates that affective commitment partially mediated the impact of anxiety/depression on job performance, thus supporting Hypothesis 33b(i). However, at Time 2 affective commitment did not mediate the relationships between social dysfunction and job performance. This result fails to support Hypothesis 33b(ii) at Time 2.

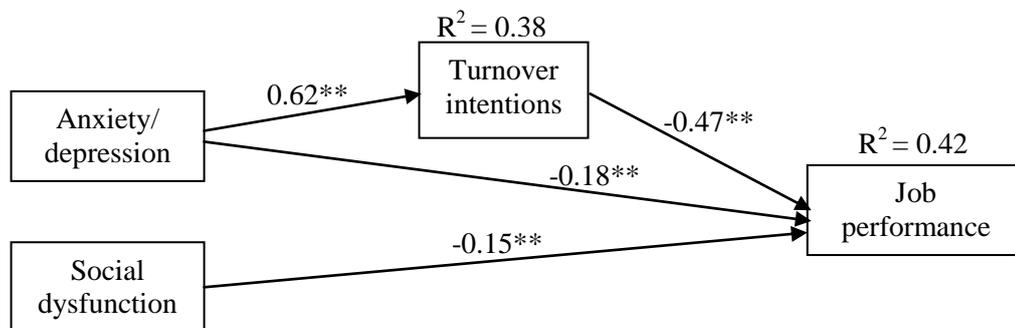
Table 8.10. Mediation effects of affective commitment at Time 2

Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
A/D→Affective→Job performance	-.29**	-.19**	-.48**	Partial
S/D→Affective→Job performance	-.13*	.00	-.13*	None

Note. A/D = Anxiety/depression; S/D = social dysfunction; Affective = affective commitment. * $p < 0.05$; ** $p < 0.001$; $n = 245$.

Model B3 (turnover intentions as a mediator) at Time 2

I next tested Model B3 at Time 2 and the original model yielded $\chi^2_{(2, n=245)} = 9.4$, $p < 0.01$; RMSEA = 0.19; RMR = 0.03; CFI = 0.93; and GFI = 0.96, indicating poor model fit. Thus, I modified the model with two added direct paths from anxiety/depression and social dysfunction to job performance. I also deleted a direct path from social dysfunction to turnover intentions, where the path coefficient was not significant. These modifications made both logical and conceptual sense given the underlying theory. The modified Model B3 as shown in Figure 8.14 yielded a reasonable fit to the data ($\chi^2_{(1, n=245)} = 0.51$, $p > 0.05$; $\chi^2/df = 0.51$; RMSEA = 0.00; RMR = 0.01; CFI = 1.00; and GFI = 1.00).



Note. ** $p < 0.01$

Figure 8.14. Modified Model B3 at Time 2 with standardised parameter estimates

As in the previous analyses, I checked the direct effect, indirect effect, and total effect statistics in order to assess the specific mediation effects of turnover intentions at Time 2. The direct effects, indirect effects, and total effects for Model B3 at Time 2 are presented at Table 8.11. Generally, the results of the mediation analyses at Time 2 were similar with those at Time 1.

Table 8.11. Mediation effects of turnover intentions at Time 2

Predictor→Mediator→Criterion	Direct effect	Indirect effect	Total effect	Degree of mediation
A/D→Turnover→Job performance	-.18**	-.29**	-.47**	Partial
S/D→Turnover→ Job performance	-.15**	.00	-.15**	None

Note. A/D = Anxiety/depression; S/D = social dysfunction; Turnover = turnover intentions. ** $p < 0.001$; $n = 245$.

Only one out of two mediation routes was significant for Model B3 at Time 2. The indirect effects of turnover intentions were significant in the relationship between anxiety/depression and job performance. More specifically, turnover intentions partially mediated the impact of anxiety/depression on job performance, thus supporting Hypothesis 33c(i). However, turnover intentions did not mediate the relationships between social dysfunction and job performance. This result fails to support Hypothesis 33c(ii).

To conclude, the results of the current study provide some support for the mediation effects of job satisfaction, affective commitment, and turnover intentions (Model B). Job satisfaction mediated the relationships between social dysfunction and job performance at both times. Affective commitment mediated the effects of anxiety/depression and social dysfunction on job performance at Time 1, but only mediated the effect of anxiety/depression on job performance at Time 2. Turnover intentions only mediated the effect of anxiety/depression on job performance, but not the effect of social dysfunction on job performance at both times. Overall, seven out of 12 mediation routes tested for Model B at Times 1 and 2 were significant.

Chapter Summary

This chapter presented the results of cross-sectional mediation analyses at Times 1 and 2. The results of this study illustrated that the overall mediation model had a reasonable model fit. I then decomposed the overall model into two parts in order to test the specific mediation effects. First, I tested the mediation effects of psychological strain in the relationships between work design (job demands,

timing control, methods control, skill discretion, and decision authority) and the work attitude variables of job satisfaction, affective commitment, and turnover intentions (Model A). Then, I tested the mediation effects of job satisfaction, affective commitment, and turnover intentions in the relationships between psychological strain and job performance (Model B).

The results for Model A showed only partial support for the hypotheses. Anxiety/depression mediated the relationships between job demands, methods control, and skill discretion and the criterion variables at both times. Anxiety/depression did not mediate the relationships between either timing control or decision authority and any of the criterion variables. Social dysfunction mediated the relationships between methods control and the criterion variables at both times, but did not mediate the relationships between: job demands, timing control, skill discretion, and decision authority with any of the criterion variables. These results suggest that anxiety/depression operated better as a mediator, than social dysfunction.

The results for Model B demonstrated that the hypotheses were generally supported. Job satisfaction mediated the relationships between social dysfunction and job performance at both times but did not mediate the relationships between anxiety/depression and job performance. Affective commitment mediated the relationships between anxiety/depression and job performance at both times. However, affective commitment mediated the effect of social dysfunction on job performance at Time 1 but not at Time 2. Turnover intentions mediated the relationships between anxiety/depression and job performance at both times, but did not mediate the relationships between social dysfunction and job performance. Accordingly, the results suggest that job satisfaction functions as mediator in the relationship between social dysfunction and job performance. Affective commitment and turnover intentions function as mediators in the relationships between anxiety/depression and job performance. In the following chapter (Chapter 9), I discuss the results of the longitudinal mediation analyses.

CHAPTER 9

LONGITUDINAL ANALYSES OF MEDIATION EFFECTS

Chapter Overview

This chapter presents the findings from the longitudinal mediation analyses. Firstly, I discuss the analytical approach used to test the longitudinal mediation with two-wave data and secondly, I present the results of the longitudinal mediation analyses. The results are divided into two parts: (1) the longitudinal mediation effects of psychological strain in the relationships between work design and the work attitude variables (job satisfaction, affective commitment, and turnover intentions) and (2) the longitudinal mediation effects of job satisfaction, affective commitment, and turnover intentions in the relationships between psychological strain and job performance.

Analytical Strategy

As in the cross-sectional analysis, I conducted structural equation modeling (SEM) using AMOS 18 to examine the longitudinal mediation hypotheses. A longitudinal design enabled me to test for mediation effects in a more rigorous manner. I employed the autoregressive mediation model following MacKinnon (1994) and Cole and Maxwell (2003) to examine the longitudinal mediation hypotheses. Figure 9.1 illustrates the autoregressive mediation model approach. In this model, the criterion variable at Time 2 is predicted by both the predictor and criterion variables at Time 1, as well as by the mediator at Time 2 (MacKinnon, 2008).

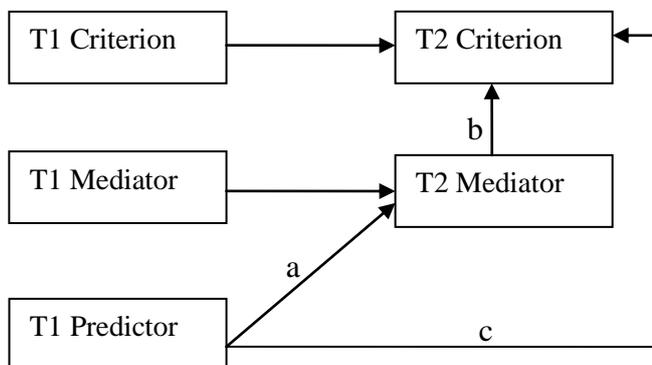


Figure 9.1. Longitudinal autoregressive mediation model

Based on this approach, I tested the relation between the T1 predictor and T2 mediator, but examined only the contemporaneous relation between T2 mediator and T2 criterion. In order to provide more evidence for temporal sequence of mediator and criterion variables, I controlled for the T1 mediator and the T1 criterion. Controlling for the mediator and criterion variables at Time 1 is important to avoid the potential confounding effect of the T1 mediator on the T2 mediator and also the T1 criterion on the T2 criterion. Without controlling for these effects, estimates of the causal paths may be spuriously inflated (Cole & Maxwell, 2003). In addition, the error terms of each indicator at Time 1 were allowed to covary with the corresponding indicator at Time 2, as is usual in longitudinal structural equation models (e.g. Hakanen, Schaufeli, & Ahola, 2008). Moreover, following Gollob and Reichardt (1991), I also estimated the total effect ($ab + c$) of the T1 predictor on T2 criterion to fulfil the assumption of the longitudinal mediation effect using this approach.

Overall Longitudinal Mediation Model

Before I examined the specific mediation effects, I tested the model fit for the overall longitudinal model, shown in Figure 9.2. The model yielded a reasonable fit after modification of the original model as suggested by the modification indices. Two direct paths from T2 anxiety/depression and T2 social dysfunction to T2 job performance were added. This significantly improved the model fit and also made logical and conceptual sense. The fit of the modified model yielded a $\chi^2_{(52, N = 245)} = 106.60$, $p < 0.01$; $\chi^2/df = 2.1$; RMSEA = 0.07; RMR = 0.06; CFI = 0.96; and GFI = 0.95. The standardised path coefficients can be seen in Appendix I.

The main purpose in this analysis was to assess the specific longitudinal mediation effect for each mediator. As stated previously, AMOS does not report significance tests for multiple mediation effects, thus I decomposed the overall longitudinal mediation model into two parts following the approach suggested by Klien, Fan, and Preacher (2006). The first part posits the longitudinal mediation effect of the psychological strain components (Model A) and the second part hypothesises the longitudinal mediation effects of job satisfaction, affective commitment, and turnover intentions (Model B).

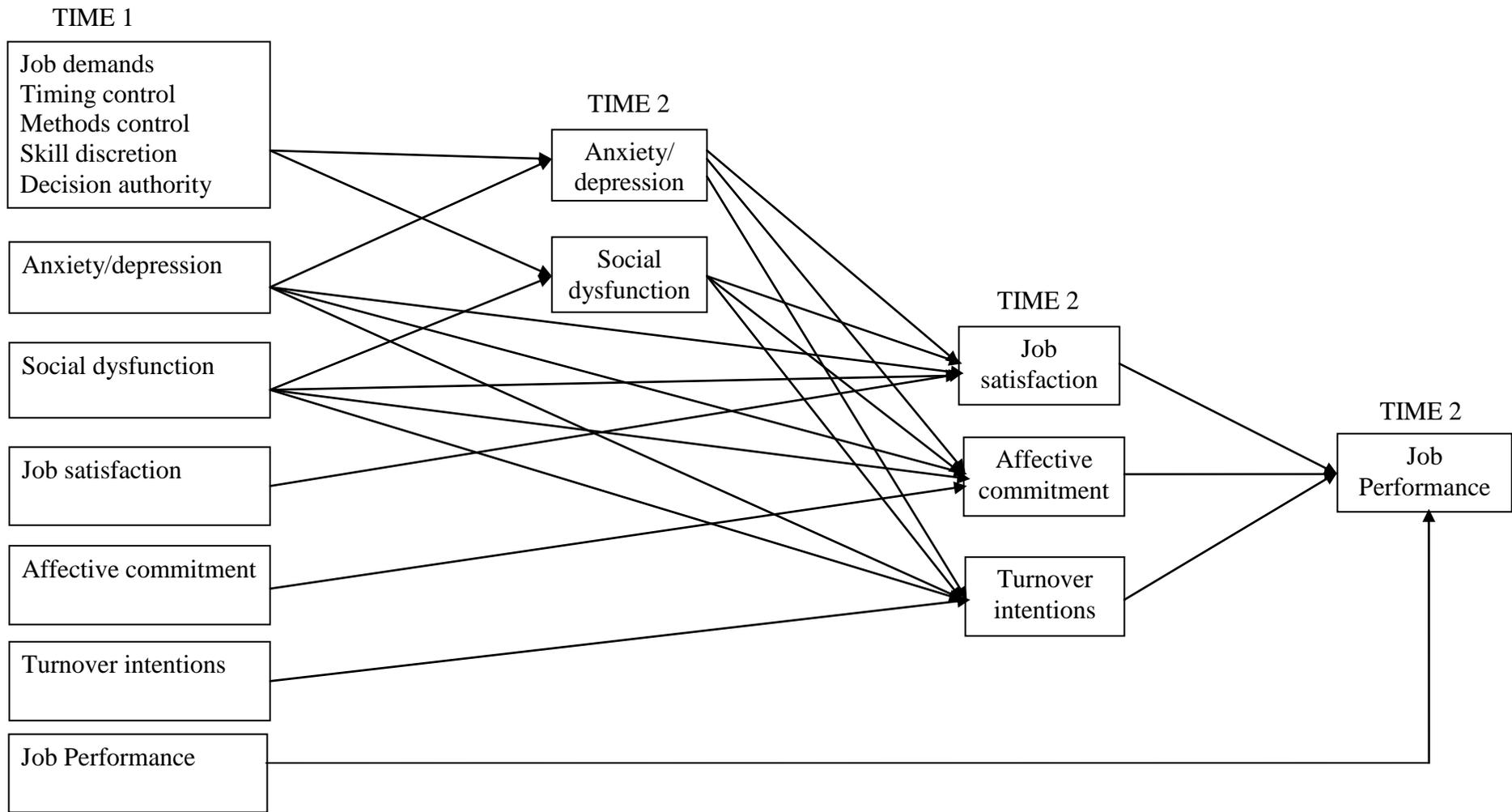


Figure 9.2. Overall Longitudinal Model

Longitudinal mediation effect of psychological strain (Model A)

In the first part of my longitudinal mediation model, I hypothesised that psychological strain would mediate the effects of work design on the work attitude variables over time (Hypotheses 32a and 32b). Figure 9.3 presents the full structural model of the longitudinal mediation effects of psychological strain (Model A). I used work design variables at Time 1 as the predictor variables. Anxiety/depression and social dysfunction at Time 2 served as the mediating variables. Job satisfaction, affective commitment, and turnover intentions at Time 2 were the criterion variables. I controlled for both mediator and criterion variables at Time 1 to avoid the potential confounding effect of the T1 mediator on the T2 mediator and also the T1 criterion on the T2 criterion.

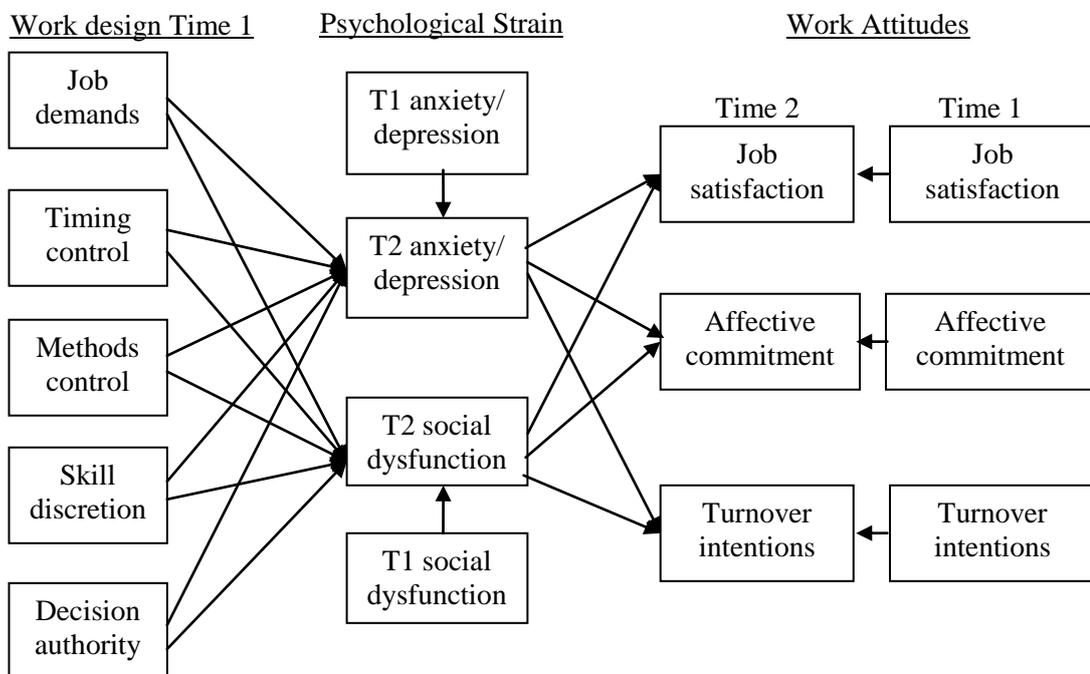


Figure 9.3. Longitudinal mediation effects of psychological strain (Model A)

Initially, the overall Model A with no modification demonstrated a poor fit ($\chi^2_{(39, n=245)} = 155.58, p < 0.01; \chi^2/df = 4.0; RMR = 0.09; RMSEA = 0.11; GFI = 0.88;$ and $CFI = 0.93$). The modification indices suggested that adding one covariance between the error term of T2 affective commitment and error term of T2 turnover intentions would significantly improve the fit of the model. The modified model demonstrated a good fit ($\chi^2_{(38, n=245)} = 84.18, p < 0.01; \chi^2/df = 2.2; RMR = 0.06; RMSEA = 0.07; GFI = 0.96;$ and $CFI = 0.96$).

The standardised path coefficients showed that T1 job demands were significantly positively related to T2 anxiety/depression ($\beta = 0.31$) and T2 social dysfunction ($\beta = 0.17$). T1 timing control was significantly negatively related to T2 anxiety/depression ($\beta = -0.41$) but not to T2 social dysfunction. There were no significant direct links from T1 methods control, T1 skill discretion, and T1 decision authority to T2 anxiety/depression or T2 social dysfunction. T2 anxiety/depression was significantly negatively related to T2 affective commitment ($\beta = -0.46$) and positively related to T2 turnover intentions ($\beta = 0.60$), but not T2 job satisfaction. T2 social dysfunction was only significantly negatively related to T2 job satisfaction ($\beta = -0.22$) but not T2 affective commitment and T2 turnover intentions.

As in the previous analyses, my main purpose in this analysis was to examine the specific longitudinal mediation effects of anxiety/depression and social dysfunction. The test of the overall longitudinal model in Figure 9.3 would not allow me to individually evaluate the specific hypothesised mediated relationships because AMOS reports significance tests only for the combined indirect effects of anxiety/depression and social dysfunction. Therefore, I decomposed the model into two separate sub-models, each representing a different mediator, i.e. T2 anxiety/depression (Model A1) and T2 social dysfunction (Model A2).

Results for T2 anxiety/depression as a mediator (Model A1)

Model A1 with no modification did not yield an acceptable fit ($\chi^2_{(30, n = 245)} = 133.59, p < 0.01; \chi^2/df = 4.4; RMR = 0.10; RMSEA = 0.12; GFI = 0.93; \text{and CFI} = 0.89$). The modification indices suggested that adding one covariance between the error term of T2 affective commitment and error term of T2 turnover intentions would significantly improve the model fit. Figure 9.4 presents the modified longitudinal mediation effects of anxiety/depression (Model A1). The fit for the modified Model A1 was good ($\chi^2_{(29, n = 245)} = 62.11, p < 0.01; \chi^2/df = 2.1; RMR = 0.07; RMSEA = 0.06; GFI = 0.96; \text{and CFI} = 0.97$). The standardised path coefficients show that only T1 job demands and T1 timing control were significantly related to T2 anxiety/depression over time. T2 anxiety/depression was significantly related to T2 affective commitment and T2 turnover intentions,

but not T2 job satisfaction. There were no direct effects of T1 methods control, T1 skill discretion, and T1 decision authority on T2 anxiety/depression.

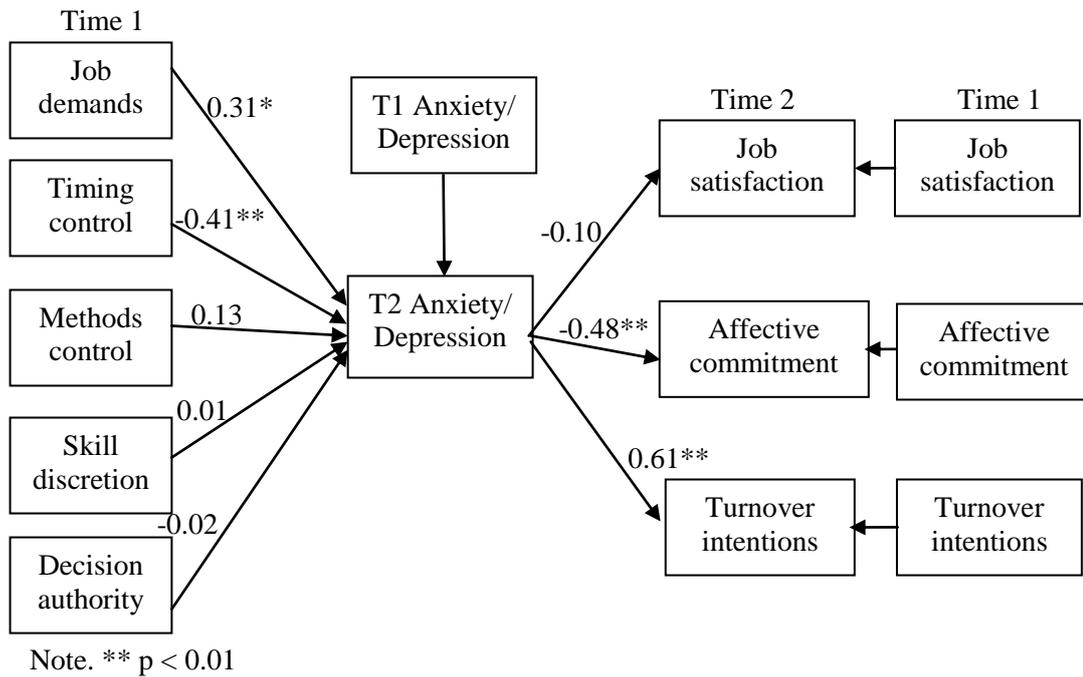


Figure 9.4. Longitudinal mediation effects of T2 anxiety/depression (Model A1) with standardised parameter estimates

In order to examine the specific longitudinal mediation effect of T2 anxiety/depression, I checked the direct effect, indirect effect and total effect statistics. Table 9.1 presents the indirect effects and total effects for longitudinal Model A1. In brief, no direct effects were obtained of T1 job demands, T1 timing control, T1, methods control, T1 skill discretion, and T1 decision authority on any of the criterion variables. The total effects were significant in the relationships between T1 job demands and both T2 affective commitment and T2 turnover intentions. The total effects were also significant in the relationships between T1 timing control and both T2 affective commitment and T2 turnover intentions. These results fulfil the assumptions for longitudinal mediation using the autoregressive approach.

Only four out of 15 mediation routes were significant. Specifically, the indirect effects of T2 anxiety/depression were significant in the relationships between T1 job demands and both T2 affective commitment and T2 turnover intentions. T2 anxiety/depression fully mediated the effects of T1 job demands on both T2

affective commitment and T2 turnover intentions, but not T2 job satisfaction. The indirect effects of T2 anxiety/depression were also significant in the relationships between T1 timing control and both T2 affective commitment and T2 turnover intention. T2 anxiety/depression fully mediated the effect of T1 timing control on both T2 affective commitment and T2 turnover intentions. However, T2 anxiety/depression did not mediate the effects of T1 timing control on T2 job satisfaction.

The indirect effects of T2 anxiety/depression were not significant in the relationships between T1 methods control, T1 skill discretion, and T1 decision authority and any of the criterion variables. Hence, T2 anxiety/depression did not mediate the effects of T1 methods control, T1 skill discretion, and T1 decision authority on any of the outcome variables.

Table 9.1. Longitudinal mediation effect of anxiety/depression (Model A1)

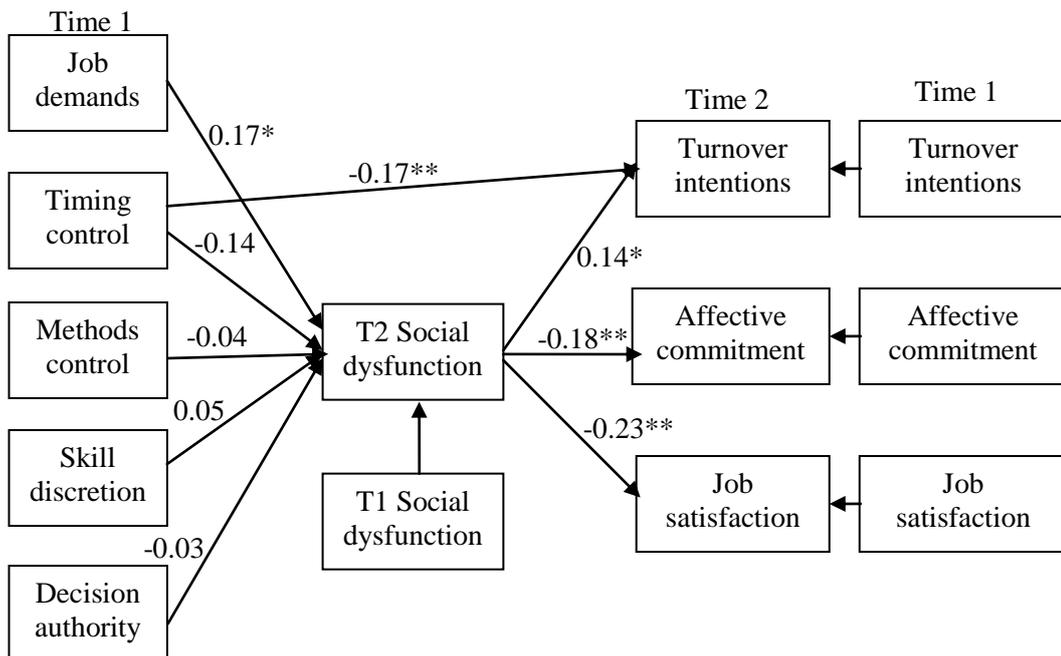
T1 Predictor →T2 Mediator →T2 Criterion	Indirect effect	Total effect	Degree of mediation
Job demands→A/D→Job satisfaction	-0.03	-0.03	None
Job demands→A/D→Affective Commitment	-0.15**	-0.15**	Full
Job demands→A/D→Turnover intentions	0.19**	0.19**	Full
Timing control→A/D→Job satisfaction	0.04	0.04	None
Timing control→A/D→Affective commitment	0.19**	0.19**	Full
Timing control→A/D→Turnover intentions	-0.25**	-0.25**	Full
Methods control→A/D→Job satisfaction	-0.01	-0.01	None
Methods control→A/D→Affective commitment	-0.06	-0.06	None
Methods control→A/D→Turnover intentions	0.08	0.08	None
Skill discretion→A/D→Job satisfaction	-0.00	-0.00	None
Skill discretion→A/D→Affective commitment	-0.01	-0.01	None
Skill discretion→A/D→Turnover intentions	0.01	0.01	None
Decision authority→A/D→Job satisfaction	0.00	0.00	None
Decision authority→A/D→Affective commitment	0.01	0.01	None
Decision authority→A/D→Turnover intentions	-0.01	-0.01	None

Note. n = 245. **p < 0.01; A/D = anxiety/depression.

Overall, the results provide minimal support for Hypothesis 32a. T2 anxiety/depression only mediated the impact of T1 job demands and T1 timing control on T2 affective commitment and T2 turnover intentions over time.

Results for T2 social dysfunction as a mediator (Model A2)

Model A2 with no modification did not result in an acceptable fit ($\chi^2_{(30, n = 245)} = 197.86, p < 0.01; \chi^2/df = 6.6; RMR = 0.14; RMSEA = 0.15; GFI = 0.91; \text{ and } CFI = 0.79$). The modification indices suggested that adding one covariance between the error term of T2 affective commitment and the error term of T2 turnover intentions would significantly improve the fit of the model. The modification indices also suggested that adding a direct path from T1 timing control to T2 turnover intentions would also significantly improve the model fit. The added pathway statistically improved the fit of the model and also made logical and conceptual sense. Figure 9.5 presents the modified longitudinal Model A2.



Note. **p < 0.01; *p < 0.05

Figure 9.5. Longitudinal mediation effects of T2 social dysfunction (Model A2) with standardised parameter estimates

The modified Model A2 was a reasonable fit ($\chi^2_{(28, n = 245)} = 73.27, p < 0.01; \chi^2/df = 2.6; RMR = 0.08; RMSEA = 0.08; GFI = 0.96; \text{ and } CFI = 0.94$). The

standardised path coefficients show that T1 job demands were significantly related to T2 social dysfunction over time. T1 timing control, T1 methods control, T1 skill discretion, and T1 decision authority were not significantly related to T2 social dysfunction. T2 social dysfunction was significantly related to T2 job satisfaction, T2 affective commitment and T2 turnover intentions.

As in the previous analysis, I examined the direct effect, indirect effect, and total effect statistics to test the specific mediation effect of T2 social dysfunction. Table 9.2 presents the results of the indirect effect and total effect statistics for longitudinal Model A2. Only direct effect of T1 timing control on T2 turnover intentions was significant. The total effects were significant in the relationships between T1 job demands and each of T2 criterion variables. These results fulfil the assumptions for longitudinal mediation using the autoregressive approach.

Table 9.2. Longitudinal mediation effects of social dysfunction (Model A2)

T1 Predictor → T2 Mediator → T2 Criterion	Indirect effect	Total effect	Degree of mediation
Job demands → S/D → Job satisfaction	-0.04*	-0.04*	Full
Job demands → S/D → Affective commitment	-0.03*	-0.03*	Full
Job demands → S/D → Turnover intentions	0.02*	0.02*	Full
Timing control → S/D → Job satisfaction	0.03	0.03	None
Timing control → S/D → Affective commitment	0.03	0.03	None
Timing control → S/D → Turnover intentions	-0.02	-0.19**	None
Methods control → S/D → Job satisfaction	0.01	0.01	None
Methods control → S/D → Affective commitment	0.01	0.01	None
Methods control → S/D → Turnover intentions	-0.01	-0.01	None
Skill discretion → S/D → Job satisfaction	-0.01	-0.01	None
Skill discretion → S/D → Affective commitment	-0.01	-0.01	None
Skill discretion → S/D → Turnover intentions	0.01	0.01	None
Decision authority → S/D → Job satisfaction	0.01	0.01	None
Decision authority → S/D → Affective commitment	0.01	0.01	None
Decision authority → S/D → Turnover intentions	-0.01	-0.01	None

Note. $n = 245$. ** $p < 0.01$; * $p < 0.05$. S/D = social dysfunction.

Table 9.2 shows that only three out of 15 mediation effects of social dysfunction over time were significant. Specifically, the results indicate that the indirect effects of T1 job demands on each of T2 job satisfaction, T2 affective commitment, and T2 turnover intentions through T2 social dysfunction were statistically significant. These results show that T2 social dysfunction fully mediated the effects of T1 job demands on T2 job satisfaction, T2 affective commitment, and T2 turnover intentions over time.

There were no significant indirect effects of T1 timing control, T1 methods control, T1 skill discretion, and T1 decision authority on any of the criterion variables at Time 2 via T2 social dysfunction. Hence, T2 social dysfunction did not mediate the effects of T1 timing control, T1 methods control, T1 skill discretion, and T1 decision authority on any of the criterion variables over time.

To conclude, T2 social dysfunction only mediated the impact of T1 job demands on the outcome variables over time. These results provide only little support for Hypothesis 32b.

Longitudinal mediation effects of job satisfaction, affective commitment, and turnover intentions (Model B)

In the second part of my longitudinal mediation model, I hypothesised that job satisfaction (Hypothesis 34a), affective commitment (Hypothesis 34b), and turnover intentions (Hypothesis 34c) would mediate the relationships between psychological strain and job performance over time. Figure 9.6 presents the full structural model of the longitudinal mediation effects of job satisfaction, affective commitment, and turnover intentions over time.

T1 anxiety/depression and T1 social dysfunction served as the predictor variables. T2 job satisfaction, T2 affective commitment, and T2 turnover intentions served as the mediator variables, and T2 job performance served as the criterion variable. I controlled for T1 job satisfaction, T1 affective commitment, T1 turnover intentions and T1 job performance to avoid the potential confounding effect of T1 mediator on T2 mediator and also T1 criterion on T2 criterion.

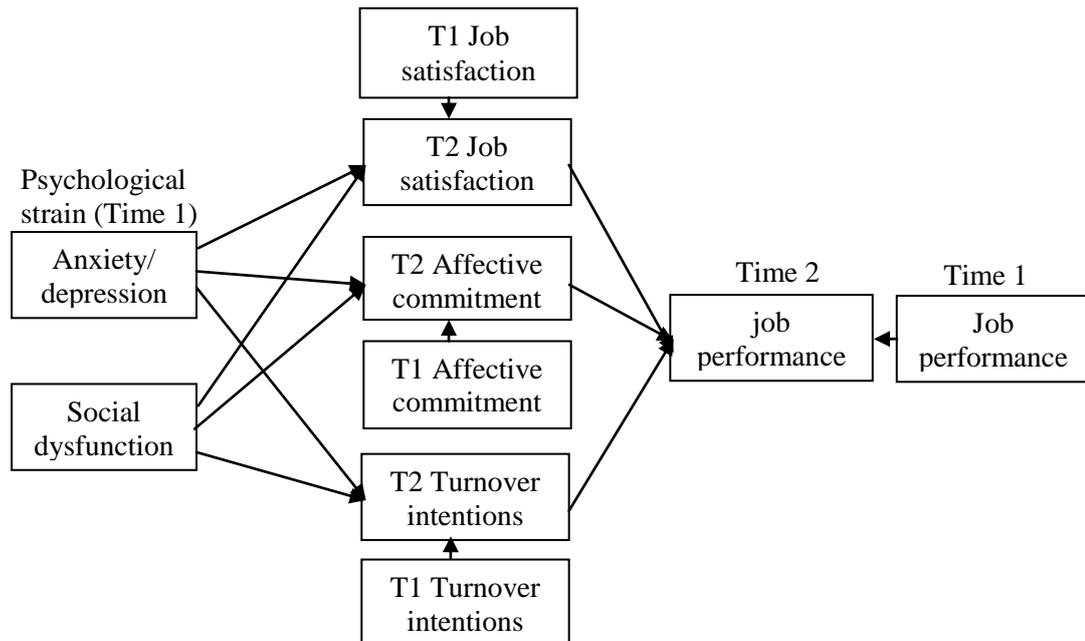


Figure 9.6. Hypothesised longitudinal mediation effects of job satisfaction, affective commitment and turnover intentions (Model B)

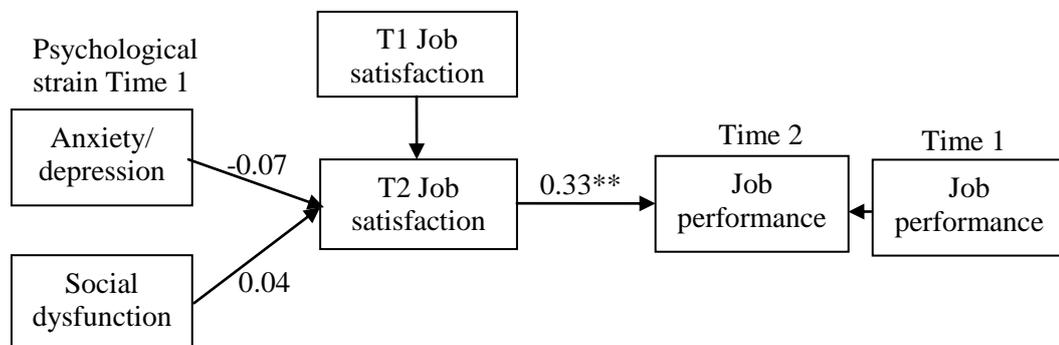
I tested the overall longitudinal mediation model as illustrated in Figure 9.6 before I examined the specific mediation effects of job satisfaction, affective commitment, and turnover intentions. The fit for the overall longitudinal model with no modification was poor ($\chi^2_{(17, n = 245)} = 175.59, p < 0.01; \chi^2/df = 10.3; RMR = 0.18; RMSEA = 0.20; GFI = 0.89; \text{ and } CFI = 0.76$). The modification indices suggested that adding three error covariances would significantly improve the model fit: between the error term of T2 affective commitment and the error term of T2 turnover intentions, and between the error term of T2 job satisfaction and the error term of T2 turnover intentions, and between the error term of T2 job satisfaction and the error term of affective commitment. The modified overall model indicated a good fit ($\chi^2_{(14, n = 245)} = 43.36, p < 0.01; \chi^2/df = 3.0; RMR = 0.09; RMSEA = 0.08; GFI = 0.96; \text{ and } CFI = 0.97$).

The standardised path coefficients showed that T1 anxiety/depression and Time 2 social dysfunction were not related to either T2 job satisfaction or T2 or T2 affective commitment or T2 turnover intentions. T2 affective commitment was related to T2 job performance ($\beta = 0.25, p < 0.01$). T2 job satisfaction was significantly related to T2 job performance ($\beta = 0.17, p < 0.01$). T2 turnover intentions were significantly related to T2 job performance ($\beta = -0.39, p < 0.01$).

As in the previous analysis, my main purpose was to examine the specific longitudinal mediation effects of job satisfaction, affective commitment, and turnover intentions in the relationships between T1 anxiety/depression and T1 social dysfunction and T2 job performance. Accordingly, I decomposed the longitudinal Model B, in Figure 9.6, into three sub-models that allowed me to separately examine each of the specific longitudinal hypothesised mediated relationships. Model B1 refers to the longitudinal mediation effects of T2 job satisfaction, controlling for T1 job satisfaction. Model B2 refers to the longitudinal mediation effects of T2 affective commitment, controlling for T1 affective commitment. Model B3 refers to the longitudinal mediation effects of T2 turnover intentions, controlling for T1 turnover intentions. I also controlled for the T1 criterion variables on the T2 criterion variables.

Results for T2 job satisfaction as a mediator (Model B1)

Figure 9.7 presents the longitudinal mediation Model B1. The fit of Model B1 was good ($\chi^2_{(4, n=245)} = 7.29, p > 0.05; \chi^2/df = 1.8; RMR = 0.02; RMSEA = 0.06; GFI = 0.98; \text{and } CFI = 0.99$). The standardised path coefficients showed that neither T1 anxiety/depression nor T1 social dysfunction was related to T2 job satisfaction over time. T2 Job satisfaction was significantly related to T2 job performance over time. The direct effects from T1 anxiety/depression and T1 social dysfunction to T2 job satisfaction were not significant, thus did not fulfilling the preconditions necessary for establishing a mediation effect. Consequently, the mediation effect of T2 job satisfaction was not significant in the relationships between anxiety/depression and T2 social dysfunction with T2 job performance. These results fail to support Hypotheses 34a(i) and 34a(ii).

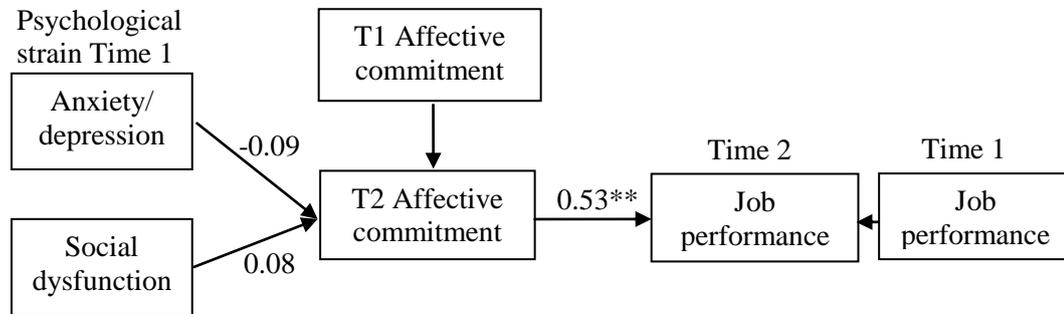


Note. ** $p < 0.01$

Figure 9.7. Longitudinal mediation effects of T2 job satisfaction (Model B1) with standardised parameter estimates

Results for T2 affective commitment as a mediator (Model B2)

Figure 9.8 illustrates the longitudinal Model B2. The model fit for Model B2 was good ($\chi^2_{(4, n = 245)} = 2.61, p > 0.05; \chi^2/df = 0.65; RMR = 0.01; RMSEA = 0.01; GFI = 1.00; \text{ and } CFI = 1.00$).



Note. ** $p < 0.01$

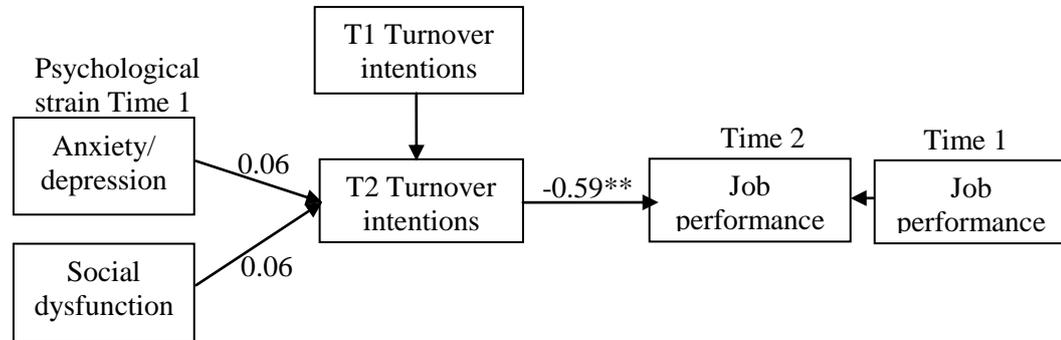
Figure 9.8. Longitudinal mediation effects of T2 affective commitment (Model B2) with standardised parameter estimates

The standardised path coefficients showed that neither T1 anxiety/depression nor T1 social dysfunction was related to T2 affective commitment over time. T2 affective commitment was related to T2 job performance over time, indicating that no significant direct effects from T1 anxiety/depression and T1 social dysfunction to T2 affective commitment. Hence, these results did not fulfil the preconditions necessary for a mediation effect, and T2 affective commitment therefore did not function as a mediator in the relationships between T1 anxiety/depression and T1 social dysfunction with T2 job performance. These results fail to support Hypotheses 34b(i) and 34b(ii).

Results for T2 turnover intentions as a mediator (Model B3)

Figure 9.9 illustrates the longitudinal mediation Model B3. The fit for Model B3 was good ($\chi^2_{(4, n = 245)} = 6.30, p > 0.01; \chi^2/df = 1.6; RMR = 0.05; RMSEA = 0.05; GFI = 0.99; \text{ and } CFI = 0.99$). The standardised path coefficients show that neither T1 anxiety/depression nor T1 social dysfunction was related to T2 turnover intentions over time. Therefore, there were no significant direct effects of T1 anxiety/depression and T1 social dysfunction on T2 turnover intentions. This result did not fulfil the precondition of mediation effect. In other words, T2

turnover intentions did not mediate the relationship between T1 anxiety/depression and T2 social dysfunction with T2 job performance. Only T2 Turnover intentions were related to T2 job performance over time. These results fail to support Hypotheses 34c(i) and 34c(ii).



Note. ** $p < 0.01$

Figure 9.9. Longitudinal mediation effects of T2 turnover intentions (Model B3) with standardised parameter estimates

To conclude, the longitudinal analyses found that there were no direct effects of T1 anxiety/depression and T1 social dysfunction on T2 job satisfaction, T2 affective commitment and T2 turnover intentions. Thus, T2 job satisfaction, T2 affective commitment and T2 turnover intentions did not function as mediators in the relationships between T1 anxiety/depression and T1 social dysfunction with T2 job performance. These results fail to provide support for the longitudinal mediation effects of job satisfaction, affective commitment and turnover intentions.

Chapter Summary

This chapter presented the longitudinal mediation effects of psychological strain in the relationships between work design (i.e. job demands, timing control, methods control, skill discretion, and decision authority) and the work attitude variables, including job satisfaction, affective commitment and turnover intentions. Also, I presented the longitudinal mediation effects of job satisfaction, affective commitment and turnover intentions in the relationships between psychological strain (anxiety/depression and social dysfunction) and job performance.

The longitudinal mediation hypotheses for psychological strain as a mediator were only partially supported. Anxiety/depression mediated the impacts of job demands and timing control on affective commitment and turnover intentions over time, but not job satisfaction. Social dysfunction only mediated the effects of job demands on job satisfaction, affective commitment and turnover intentions over time. As a result, anxiety/depression and social dysfunction only occasionally mediated the effects of work design on the outcome variables over time.

The longitudinal mediation hypotheses for the mediation effects of job satisfaction, affective commitment and turnover intentions over time were not supported. Job satisfaction, affective commitment and turnover intentions did not mediate the effects of anxiety/depression and social dysfunction on job performance over time. Thus, job satisfaction, affective commitment and turnover intentions did not function as mediators over time (six months time lag).

In the following chapter (Chapter 10), I discuss all the findings from this research with respect to the relevant literature, discuss the limitations of the study, make conclusions and recommendations for future research, and note theoretical and practical implication of the findings.

CHAPTER 10

GENERAL DISCUSSION

Discussion of the Findings

Given the enormous changes in the nature of work over the past two decades (Grant & Parker, 2009; Torraco, 2005), scholars have questioned whether existing theories regarding the effects of work design on important organisational outcomes are sufficiently comprehensive (Grant & Parker, 2009). One of these changes is the increasing importance of technical workers. Another is continuing globalisation, which heightens the need to understand whether theories developed in one region of the world (most often the West) generalise to other countries (e.g., Eastern countries) that differ in substantial ways (culture, institutional infrastructure, etc.).

The primary objective of my research was to assess a comprehensive model of the effects of work design on employee well-being among a sample of technical workers in Malaysia. This model includes several components. The model begins with hypothesised main effects of work design, social support and self-efficacy on two psychological strain components (anxiety/depression and social dysfunction). These psychological strain components were then hypothesised to relate to job satisfaction, affective commitment, turnover intentions and job performance. In addition, job satisfaction, affective commitment and turnover intentions were hypothesised to affect job performance. The model also predicted that job control, social support and self-efficacy would moderate the relationships between job demands and psychological strain. Finally, the model suggested that psychological strain would mediate the relationships between work design and work attitude variables (i.e. job satisfaction, affective commitment and turnover intentions), and that the work attitude variables would mediate the relationships between psychological strain and job performance. I empirically tested the model with a sample of technical workers in Malaysia, a country characterised as being collectivist in nature and having a high power distance culture (Hofstede, 1991).

At Times 1 and 2, respondents reported feeling moderate levels of job demands and timing control, and higher levels of methods control, skill discretion and decision authority. The overall levels of these variables were relatively stable between Time 1 and Time 2, as there were significant differences only in job demands, which decreased from Time 1 to Time 2. In terms of social support, respondents reported feeling moderate to high levels of perceived organisational support (POS), supervisor support and co-worker support. There were no significant differences between Time 1 and Time 2 levels of social support. In terms of self-efficacy, respondents reported feeling moderate levels of self-efficacy at Time 1 and high levels of self-efficacy at Time 2.

Respondents reported low levels of anxiety/depression and moderate levels of social dysfunction. Levels of anxiety/depression were stable between Time 1 and Time 2, while levels of social dysfunction decreased slightly from Time 1 to Time 2. At both times, respondents reported high levels of job satisfaction, affective commitment, and job performance, and low levels of turnover intentions. Levels of turnover intentions slightly increased from Time 1 to Time 2 and affective commitment slightly decreased from Time 1 to Time 2. The levels of job satisfaction and job performance were relatively stable across time.

My findings also highlighted that the cross-sectional results at Time 1 and Time 2 are inconsistent. These results suggested that perhaps respondents' perception of the variables is not stable across time. One possible explanation of these results may be the differences in sample size between Time 1 ($n = 429$) and Time 2 ($n = 245$). Another plausible reason may be due to the changes occurring in the organisation during the data collection period. At the time of my second time data collection, the organisation announced a revamp of its corporate structure, separating its fixed-line and mobile business into two separate companies. The organisation also appointed an external vendor to assist with the technical work. Consequently, the organisation reduced staff numbers to make the company leaner, more efficient, and more profit-oriented. The organisation implemented the company's voluntary resignation scheme (VRS). Employees at all levels were offered voluntary retirement in exchange for benefits and compensation. This may have influenced the technical workers' perceptions of work design. Perhaps

technical workers felt underutilized and consequently their job strain increased because they feel worried that they might be made redundant.

In discussing the research findings, I first review the measurement of study variables, followed by some issues concerning the design of the study. Next I discuss the main effects of work design, social support and self-efficacy, followed by the main effects of the psychological strain components, and then the main effects of work attitude variables. Furthermore, I discuss the moderating effects of job control, social support and self-efficacy. Lastly, I discuss the mediation effects of the psychological strain components and work attitude variables (i.e. job satisfaction, affective commitment, and turnover intentions).

Measurement of study variables

The high reliability (alpha coefficient) of the scales indicated that all scales provided reliable measures of the study variables. Confirmatory factor analysis (CFA) confirmed the factorial structure of latent variables at both Times 1 and 2. Work design variables consisted of two major constructs, namely job demands and job control. In the current study, I measured job demands with four constructs, including responsibility demands, problem-solving demands, attention demands, and quantitative demands. However, the CFAs suggested that the four constructs of job demands formed a single factor. Therefore, I used a single factor of job demands in subsequent analyses. Furthermore, job control variables consisted of four constructs, namely timing control, methods control, skill discretion, and decision authority. The CFAs found that the four constructs of job control were distinct, thus these four constructs of job control were used for further analyses in this study.

I differentiated social support variables into three constructs - perceived organisational support (POS), supervisor support and co-worker support. The confirmatory factor analyses found that these three constructs of social support were distinct. Therefore, I used these three social support constructs in subsequent analyses.

The current study measured psychological strain with the GHQ-12 scale (Goldberg & Williams, 1988, p.220). CFAs showed that the GHQ-12 scale

consists of two factors – anxiety/depression and social dysfunction. This result is consistent with the findings obtained by Kalliath, O’Driscoll, and Brough (2004). Consequently, I used these two factors for subsequent investigation in this study.

For job performance, I used three constructs - in-role performance (IRP), organisational citizenship behaviour towards the organisation (OCBO), and organisational citizenship behaviour towards individuals (OCBI). However, the CFAs revealed that IRP, OCBO, and OCBI formed a single construct. This result suggests that one performance factor should be used for further analyses. I also conducted CFAs on self-efficacy, job satisfaction, and affective commitment scales. The analyses suggested that all these measures have a good fit.

Design

The hypotheses of this study were tested cross-sectionally and longitudinally. The non-experimental design used in this study limited the extent to which causal relations can be inferred. Findings from the use of cross-sectional design also may be affected by common method variance. Common method variance is a type of spurious internal consistency which occurs when the apparent correlation among indicators is due to their common source (Spector, 2006). Gollob and Reichardt (1991) described three principles of causality that can be satisfied in longitudinal model but not in cross-sectional model. The first principle states that it may take time for some variables to exert their effects. For example, if variables are measured at the same time, there may not be enough time for a predictor to influence a criterion. The second principle states that variables have effects on themselves. For example, a criterion is often related to itself at a later time (auto-correlation). The last principle states that the size of an effect typically varies with the length of the time lag. For example, the size of an effect will vary depending on whether Time 1 and Time 2 are separated by a few seconds, a few days, or a few months. Therefore, longitudinal analyses through the use of a two-wave panel design help to overcome the limitations of cross-sectional analyses.

However, conclusions must be drawn with caution from this longitudinal study’s findings, for several reasons. First, only two waves of data collection were used. Although collecting data at two points has several advantages over data collection at single point in time, ideally multiple waves at data collection as preferable

(Zapf, et al., 1996). Unfortunately, due to practical constraints, this was not feasible in the present research. Second, whilst an attempt was made to use a time lag that captured causal influences among the variables and minimised problems of participant attrition, the extent to which these goals were achieved is unknown. A different measurement interval may have yielded different findings. In the present study, I used a six-month time lag to examine causal relationships between the variables. Previous research used one-month to 12-months as their time lag, although other researchers have argued that a 6-month lag is appropriate (Zapf, et al., 1996). Accordingly, I considered that a six-month time lag is adequate to examine longitudinal effects in the current study.

To some extent, the results from the longitudinal analyses were inconsistent with the results from the cross-sectional analyses. For example, the cross-sectional analyses illustrated that job demands, timing control, methods control, and skill discretion were associated with strain. However, the longitudinal analyses showed that only job demands and timing control were related to strain. This would seem to indicate that time lag plays an important role in determining the results from the longitudinal analyses (Zaheer, Albert, & Zaheer, 1999). That is, the nature of the long-term effect (e.g. six months) of timing control may have been confirmed, but not for methods control or skill discretion, which perhaps have relatively longer-term effects (i.e., more than six months) on strain. As argued by Frese and Zapf (1988), the longer a stressor impacts on a person, the higher should be the incidence of strain. Therefore, if six months is not an appropriate time lag to determine a relationship between variables, the longitudinal approach may have failed to detect those causal relationships.

Time may be experienced psychologically and physically in very different ways (Mosakowski & Earley, 2000). Kenny (1975) stated that “normally the lag between measurement is chosen because of convenience, not theory, since theory rarely specifies the exact length of the causal lag” (p.894). Probably the biggest problem is the issue of deciding when Time 2 data should be collected. This timing is critical, because measuring too soon or too late will not provide a good test of the theory. As pointed out by Mitchell and James (2001), “if a lag is too big, X wears off or other variables may come into play. If it is too small, the effect may not be complete or reactivity may trigger responses to a “treatment”

independent of its content” (p.537). Chan (1998) also said that “the bad news is that we almost never have a good approximation of what the true causal interval is” (1998, p.476). Zaheer et al. (1999) made a similar point. Despite these potential limitations, this research still obtained some theoretically interesting results, both cross-sectional and longitudinal.

Direct effects of work design, social support, and self-efficacy

In presenting the results of the main effects of work design, social support and self-efficacy, I first discuss the cross-sectional analyses and then the longitudinal analyses. A summary of the cross-sectional and longitudinal findings is depicted in Table 10.1. The main effects of work design, social support, and self-efficacy are fairly consistent with those obtained in previous studies. The results support the literature reporting harmful consequences of excessive job demands and beneficial aspects of higher levels of job control variables, social support, and self-efficacy.

Table 10.1. Summary of the results for the main effects of work design, social support, and self-efficacy on psychological strain

Predictor	Time 1		Time 2		Longitudinal	
	A/D	S/D	A/D	S/D	A/D	S/D
Job demand	√		√		√	√
Timing control	√				√	
Methods control	√					
Skill discretion	√					
Decision authority						
POS						√
Supervisor support				√		
Co-worker support		√				
Self-efficacy	√	√	√	√		

Note. A/D = anxiety/depression; S/D = social dysfunction

The cross-sectional and longitudinal findings showed that job demands were positively associated with anxiety/depression among these technical workers in Malaysia. These results are consistent with previous studies in Western contexts (e.g., Bakker & Demerouti, 2007; ter Doest, et al., 2006). They also suggest that

job demands have an immediate and a long term effect on anxiety/depression, indicating that high levels of demand were linked with high levels anxiety/depression. The stressor-strain perspective serves as the theoretical basis for explaining the negative effects of job demands (Podsakoff, et al., 2007). According to this perspective, work stressors such as job demands are the stimuli that induce the stress process, and forms of strain such as anxiety/depression (Jex, 1998). Thus, job demands appear to be an important predictor of anxiety/depression.

Interestingly, the findings suggest that job demands only influence social dysfunction in a longer term but not in a shorter term. Cultural context may have influenced these findings. As discussed previously, people in a collectivistic culture view themselves in terms of social connections with co-workers and the employer, and would be willing to sacrifice self-interest for the interest of the larger collective. Social dysfunction refers to emotional problems related to social interaction (e.g., conflict). Hence, for the good of the group technical workers may try to avoid emotional problems that are related to social interaction. However, in a long-term, these technical workers may have felt that high job demands become more stressful. Perhaps their energy was depleted because of the exposure to high job demands in a longer term. As argued by Lazarus and Folkman (1984), stressful conditions (e.g., high job demands) may influence strains depending on how people interpret these stressors.

Similar to previous studies which have found positive effects of greater job control, the cross-sectional analyses found that higher levels of timing control, methods control, and skill discretion were positively related to anxiety/depression. This study's results are in line with previous studies which found that lack of job control consistently predicts job-related strain (e.g., Frese, 1989; Karasek & Theorell, 1990; O'Driscoll & Cooper, 1996). However, decision authority was not related to the psychological strain components. This result may be influenced by the collectivistic, high power distance culture in Malaysia. Collectivists tend to believe they have less personal authority than do others typically classified as individualists (Hui, 1982). In addition, in a high power distance country such as Malaysia, employees expect to follow instructions from their superior. Decision authority tends to be centralised because superiors treat it as solely their

responsibility. Employees are viewed as incapable of contributing to decision-making. As a consequence, employees are likely to accept centralised power and dependence on superiors for directions. Personal initiative by employees is not valued and they are only expected to implement policies dutifully. In other words, having more decision authority might not be valued and could actually lead to increased strain. Perhaps the technical workers felt that having decision authority might increase their responsibility and lead to increased strain.

The longitudinal analyses revealed that only timing control was associated with reduced anxiety/depression, suggesting that timing control is an important predictor of anxiety/depression among these technical workers. One possible explanation of this result may be that these technical workers were required to work outside the organisation (e.g. providing technical support to customers). Accordingly, they needed greater timing flexibility to do their tasks. Thus, greater timing control might have reduced levels of anxiety/depression among the technical workers. A six-month time lag was also sufficient to show the impact of timing control on anxiety/depression.

Interestingly, both cross-sectional and longitudinal analyses demonstrated that none of the job control variables affected social dysfunction among technical workers. As mentioned earlier, social dysfunction reflects emotional problems experienced in social situations. A plausible reason why job control variables were not linked to emotional problems relating to social situations could be the cultural context. People in a collectivist culture view themselves in terms of social connections and group harmony. They would be willing to sacrifice self-interest for the interest of the larger collective. Collectivist societies also emphasise group harmony over individual achievement (Spector, Sanchez, Siu, Salgado, & Ma, 2004). To be effective in collectivist societies, one must cultivate relationships with colleagues at all levels, and must express a high level of social sensitivity. People in collectivist societies try to avoid conflict and focus on group achievement. Therefore, perceived lack of personal control may not necessarily predict social dysfunction. In other words, people in collectivist societies perhaps perceive personal control as less important. Another possible reason is that job control is irrelevant to social dysfunction among these technical workers. That is, the job control variables measured in the current study did not match with social

dysfunction (e.g., Wall, et al., 1996). As noted by Wall and colleagues (1996), there is a possibility that the failure to obtain empirical support for the direct effect of job control on social dysfunction is due to inadequate operationalisation of job control.

In terms of social support, the cross-sectional findings showed that supervisor support and co-worker support significantly predicted psychological strain (predominantly social dysfunction). These results are consistent with previous studies that found higher levels of supervisor support and co-worker support reduced levels of psychological strain (e.g., Jain & Sinha, 2005; Rhodes & Eisenberger, 2002). My findings are in line with previous research showing that individuals who receive social support (e.g., supervisor support and co-worker support) experience less strain than those who do not receive such support, because support protects individuals from the potentially harmful consequences of stressful life events (e.g., Cooper, et al., 2001; Sargent & Terry, 2000). This occurs by helping them deal with a problem or, emotionally, by modifying their perception that the stressor is damaging to their well-being.

The findings also demonstrated that social support was related to social dysfunction but not anxiety/depression. The collectivist culture might be responsible for social support only relating to social dysfunction. As mentioned previously, social dysfunction reflects the emotional problems related to social situations (e.g., conflict). Collectivism reflects subordination of personal goals to group goals, a sense of harmony and interdependence, and concern for others (Hui & Triandis, 1986). In collectivist cultures, people belong to in-groups, and the groups are supposed to look after individuals. Technical workers might be expecting their organisation, supervisors or co-workers to help them deal with stressful situations. Social support may give direct access to social resources to deal with the effects of social dysfunction. For example, in a conflict with a supervisor, support by one's co-workers will immediately be helpful. However, anxiety/depression reflects more general emotional reactions to stressful situations, such as being unhappy and depressed, which may not be relieved by social support. People in a collectivist with high power distance culture tend to use emotion coping strategies to solve these problems (Liu & Spector, 2005). Liu and Spector (2005) argued that changing oneself (emotion-focused coping) is the

more feasible method for people from a high power distance culture to deal with job stress such as anxiety/depression. Perhaps technical workers regulate their emotion to cope with their level of anxiety/depression rather than seek support from their supervisors or co-workers. Hence, social support was not necessarily associated with reduced anxiety/depression.

The longitudinal analyses, however, illustrated that only perceived organisational support (POS) was associated with reduced social dysfunction. POS had no initial effect on social dysfunction, but did have an effect after a lag of six months, which would suggest that the impact of POS on social dysfunction may take some time to emerge. A six-month time lag is perhaps sufficient to show the effects of POS on social dysfunction. A plausible reason why POS had a longer term effect rather than an immediate effect is based on the conceptualisation of POS. According to Eisenberger, Huntington, Hutchinson and Sowa (1986), POS is based on the premise that employees develop global beliefs concerning how much the organisation values them and cares about their well-being. This perspective also suggests that POS is partially a function of the appraisals which employees make about organisations and their actions (Rhodes & Eisenberger, 2002). Accordingly, it is likely that an employee needs a longer time (e.g., six months) to evaluate the support they receive from their organisation.

Social support from supervisors and co-workers had no effect on either anxiety/depression or social dysfunction over six months. Perhaps the effects of supervisor support and co-worker support had dissipated after the six months period. As discussed earlier, supervisor support and co-worker support were linked to social dysfunction in the cross-sectional analyses. However, the effects of supervisor support and co-worker support were not associated with strain over time. These findings suggest that support from supervisors and co-workers only had an immediate relationship with psychological strain.

This study also suggests that self-efficacy appears to be as potent a positive force in collectivist, high power distance cultures as it has been found to be in individualistic Western countries, since higher levels of self-efficacy were related to decreased levels of anxiety/depression and social dysfunction. These findings are in line with previous research showing that self-efficacy has a direct effect on

employee well-being (e.g., Judge & Bono, 2001; Karademas, 2006; Kuijer & de Ridder, 2003). My results also support a study by Liu, Siu, and Cooper (2005) who found that self-efficacy was negatively related to psychological strain in a Chinese sample. The strong direct effects of self-efficacy in this study suggest that self-efficacy may be as relevant for Malaysians as for Westerners. As Bandura (1996) stressed, perceived efficacy is valued not because of reverence for individualism but because a strong sense of perceived efficacy is vital for success, regardless of whether it is achieved individually or by group members. Matsui and Onglatco (1992) also noted that low self-efficacy is stressful in collectivist cultures as in individualistic ones.

The finding that perceived self-efficacy affects anxiety/depression and social dysfunction is easy to explain. Confidence in their abilities makes employees believe they can control job situations and handle them well, which ultimately results in increased confidence, reduced vulnerability perceptions, and reduced feeling of strain (Schaubroeck, et al., 2000). When technical workers have little confidence in their capability to do their tasks, they will likely give up easily in the face of obstacles. As a consequence, they feel themselves ineffective in their attempt to maintain their task performance. It is reasonable to assume that these feelings of ineffectiveness will influence feeling of strain. Technical workers who doubt their ability to do their job also do less to solve the problems encountered in their job.

The longitudinal findings, however, suggest that self-efficacy was not linked to anxiety/depression and social dysfunction over a six-month time lag. Perhaps the effect of self-efficacy is more short-term rather than long-term. That is, self-efficacy was related to anxiety/depression and social dysfunction at both Times 1 and 2, but not longitudinally. These results seem to suggest that self-efficacy had only an immediate relationship with psychological strain among these technical workers. However, this is only my assumption because no previous research was available with which to estimate the time lag at which self-efficacy and strain influence each other. The time lag between the measurement points in this study was arbitrarily specified at six months. Clearly, it is desirable to identify the appropriate temporal lag for the effects of self-efficacy on psychological strain in future longitudinal studies.

To conclude, job demands were found to be highly predictive of technical workers' feelings of anxiety/depression and social dysfunction. Job control, including timing control, methods control, and skill discretion were associated with anxiety/depression, particularly at Time 1. Only timing control was related to anxiety/depression in the longitudinal analyses. Social support from supervisors and co-workers also predicted strain among technical workers, especially in the cross-sectional analyses, whereas only POS was associated with strain in the longitudinal analyses. Self-efficacy was also found to be predictive of anxiety/depression and social dysfunction, but only in the short-term.

Direct effects of psychological strain

Psychological strain is conceptualised as a psychological reaction to a stressor that includes anxiety/depression and social dysfunction (Beehr, 1995). Psychological strain results from the joint effects of the demands of a work situation and the extent of decision-making freedom (discretion) available to the worker facing those demands (Karasek, 1979). Because strain is undesirable, it triggers negative emotion and cognitions such as job dissatisfaction, lack of commitment, high turnover intentions and reduced job performance (Podsakoff, et al., 2007). In general, the findings of the current study support the view that psychological strain will be associated with various outcomes, particularly in the cross-sectional analyses (see Table 10.2).

Table 10.2. Summary of results for the main effects of psychological strain

Predictor	Time 1				Time 2				Longitudinal			
	JS	AC	TOI	JP	JS	AC	TOI	JP	JS	AC	TOI	JP
Anxiety/ depression		√	√	√		√	√	√				
Social dysfunction	√	√		√	√			√				

Note. JS = job satisfaction, AC = affective commitment, TOI = turnover intentions; JP = job performance.

More specifically, the cross-sectional findings at Times 1 and 2 revealed that social dysfunction was consistently associated with job dissatisfaction among technical workers in Malaysia. As mentioned earlier, social dysfunction reflects

the technical workers' emotional problems experienced in social situations. Emotional problems related to social situations among technical workers may reduce their levels of job satisfaction. The cultural context may be responsible for this result. For example, Malaysian workers are group oriented, respect elders and hierarchy, emphasise loyalty and consensus, and are concerned with harmony in relationships (Schermerhorn & Bond, 1997). People in collectivist cultures emphasise social connections and networks. With their greater emphasis on social connections and networks, collectivists are likely to be more sensitive to interpersonal conflicts and other interpersonal problems. For that reason, social dysfunction might be associated with job dissatisfaction among these technical workers.

However, anxiety/depression was not associated with job satisfaction at both times. These findings are inconsistent with Western studies that found anxiety/depression was relatively strongly associated with job satisfaction. The notion of anxiety/depression might be responsible for these findings. As noted previously, anxiety/depression reflects general emotional reactions related to stressful situations (e.g., unhappy with work environments). Anxiety/depression may be more related to employees' emotional reactions to work itself rather than social aspects of the job. Perhaps collectivistic culture suppresses the relationship between anxiety/depression and job satisfaction for the best of the group. Accordingly, anxiety/depression was not related to job dissatisfaction among these technical workers.

Furthermore, the cross-sectional findings showed that psychological strain (especially anxiety/depression) was associated with reduced affective commitment. These results are in line with previous research. For example, Meyer, Stanley, Herscovitch, and Topolnytsky (2002) reported a statistically significant correlation between low affective commitment and various indicators of strain. The reason why psychological strain was negatively related to affective commitment is based on social-exchange theory (Adams, 1965; Blau, 1964). Social exchange theory is based on the premise that human behaviour or social interaction is an exchange activity (Homans, 1961, pp. p.12-13). The basic assumption of this theory is that individuals establish and continue social relations on the expectation that such relations will be mutually advantageous (Zafirovski,

2005). According to this theory, people strive to balance what they give and receive from social exchanges. A committed employee might be expecting that his or her organisation will provide a good work environment in exchange for his or her commitment to the organisation. Thus, if the organisation fails to provide a better work environment, this might reduce affective commitment among employees.

Analyses at Times 1 and 2 also found that higher levels of anxiety/depression were strongly related to higher levels of turnover intentions. The reason why anxiety/depression was linked to turnover intentions is based on the argument that stressful work conditions affect turnover intentions via psychological strain (De Croon, et al., 2004). Thus, feelings of anxiety/depression were related to turnover intentions, such that the higher an individual's anxiety/depression, the higher his or her turnover intentions. Anxiety/depression reflects the technical workers' emotional reactions to stressful experiences, such as being unhappy, which may induce an employee to quit their organisation.

Nonetheless, the current findings highlight that social dysfunction was not linked to turnover intentions. As discussed previously, cultural context may be responsible for this finding. People in a collectivist society might be more likely to remain loyal to the employer and respond to adverse conditions with greater affiliation with their co-workers (see also Spector, et al., 2007). Another possible reason is that the respondents in my study were relatively old (mean = 45 years), and may have felt it would be difficult to find another job. Hence, even when they experienced social dysfunction, this did not lead to a desire to leave the organisation.

The findings also highlight that social dysfunction has a different effect on employee work reactions (i.e. turnover intentions and job satisfaction). As stated earlier, social dysfunction was related to job satisfaction but not turnover intentions. The correlation between job satisfaction and turnover intentions was relatively low ($r = -0.26$ at Time 1, -0.25 at Time 2, and -0.23 in the longitudinal analyses). Accordingly, job satisfaction and turnover intentions may be distinct reactions among these technical workers.

The cross-sectional analyses also showed that anxiety/depression and social dysfunction were consistently related to job performance at both Times 1 and 2. This result seems to suggest that technical workers who report more anxiety/depression and social dysfunction might be experiencing difficulty in coping with job demands and thus perform relatively less effectively. The findings of this study are consistent with previous research showing that strain predicts job performance (e.g., Cropanzano, et al., 2003; Wright & Bonnet, 1997).

This study also highlights that the relationship between anxiety/depression and job performance ($\beta = -0.38$ at Time 1 and -0.45 at Time 2) was stronger than the relationship between social dysfunction and job performance ($\beta = -0.26$ at Time 1 and -0.17 at Time 2). One possible explanation for this result is that the notion of anxiety/depression relates to emotional reactions, for example being unhappy and depressed. When technical workers feel unhappy or depressed in their jobs, this might influence their job performance in the organisation. However, the relationship between social dysfunction and job performance was relatively lower. Perhaps technical workers felt that they can deal with high social dysfunction by using an emotion coping strategy. For example, they try to rationalise the problem and accept it. Therefore, they may quell their reactions to social dysfunction for the good of the collective.

The longitudinal analyses, however, illustrated that anxiety/depression and social dysfunction did not predict any of the outcome variables (job satisfaction, affective commitment, turnover intentions, and job performance). These findings suggest that the effects of anxiety/depression and social dysfunction may have dissipated over time. A plausible reason for this result is based on Lazarus's (1966) cognitive-transactional model. This model explains that an individual will take action as a result of experiencing a stressful situation. Lazarus also acknowledged the existence of challenge appraisal, which is when situations are perceived to be very demanding but within the capabilities of the person. When situations are perceived to be challenging, the outcomes may be quite positive. Applied to this model, in a long term (e.g., six months), the technical workers may feel ready to deal with the levels of psychological strain they experience. As argued by Lazarus and Folkman (1984), both person and situation factors can also influence the initial appraisal process. The person factors include both

commitment and beliefs. If a person is committed to a course of action because the outcome is important to him or her and has a strong belief in his ability to control events related to the valued outcome, he or she will probably appraise a stressor as a challenge rather than threat. For instance, self-efficacy helps a person to cope with stressful situations. Recall that the levels of self-efficacy among technical workers increased from Time 1 to Time 2, and the levels of self-efficacy at Time 2 were high. Accordingly, technical workers with high self-efficacy may view the feelings of strain as a challenge to get promotion in their organisation. Furthermore, they also might have perceived that support from the organisation, supervisor and co-workers would be sufficient to help them to deal with their feelings of strain.

Lazarus also believed that, in addition to personal control beliefs, existential beliefs – particularly faith in God or a higher power – are critical in forming appraisals. Religion gives meaning and purpose to life by structuring one's experiences, beliefs, values and behaviours (Beit-Hallahmi & Argyle, 1997). For many Malaysian workers, religion (e.g., Islam) provides the strength to cope when faced with adversity and the tribulations of daily life. Religion also provides other benefits such as prayer and contemplation, distraction from everyday tensions, the opportunity for socialising and fellowship, and promotes a healthy lifestyle by prohibiting smoking, alcohol and drugs. Consequently, over six months it is possible that the effects of strain might be reduced or dissipated among these technical workers.

In conclusion, anxiety/depression and social dysfunction had an immediate association with job satisfaction, affective commitment, turnover intentions, and job performance, but not a longitudinal effect. Additional research is needed to confirm these conclusions. In fact, the results suggest the importance of investigating the distinct effects of psychological strain on each of the outcome variables.

Direct effects of job satisfaction, affective commitment, and turnover intentions

This study also represented an effort to examine the linkage of job satisfaction, affective commitment, and turnover intentions with job performance. The cross-

sectional analyses provide support for the hypothesised relationships, but the longitudinal analyses only for affective commitment. A summary of the findings is presented in Table 10.3.

Specifically, the cross-sectional analyses showed that job satisfaction, affective commitment, and turnover intentions consistently related to job performance at both Times 1 and 2. These findings are in line with previous research that job satisfaction and job performance correlate with one another (e.g., Iaffaldano & Muchinsky, 1985; Judge, Thoresen, Bono, et al., 2001; Spector, 1997). In addition, these findings corroborate the study by Meyer and Allen (1997) that employees with strong affective commitment to the organisation work harder at their jobs and perform better than those with weak commitment. The findings are also consistent with the findings of previous research that lower turnover intentions of employees are related to higher job performance (e.g., Carmeli & Weisberg, 2006).

Table 10.3. Summary of results for the main effects of job satisfaction, affective commitment, and turnover intentions

Predictor	Time 1	Time 2	Longitudinal
	Job performance	Job performance	Job performance
Job satisfaction	√	√	
Affective commitment	√	√	√
Turnover intentions	√	√	

A plausible explanation of these results is based on social-cognitive theory (Ajzen, 1991), which argues that attitudes toward the job would influence behaviours on the job (e.g., reflected in job performance). On the basis of this theory, job satisfaction, affective commitment, and turnover intentions function as catalysts of behaviour (see Fishbein & Ajzen, 1974; Judge, Thoresen, Bono, et al., 2001). For instance, high levels of job satisfaction and affective commitment and low levels of turnover intentions stimulate high levels of job performance.

These results are also congruent with the social exchange theory (Blau, 1964), which argues that employees who value benefits received from their organisation, such as working conditions, will reciprocate with more positive attitudes. Blau's

(1964) social exchange theory suggests that employees will trade their efforts for the promise of rewards in the future. Therefore, employees experiencing high job satisfaction and affective commitment, and low turnover intentions should reciprocate with better job performance (see also Fried, Shirom, Gilboa, & Cooper, 2008).

Another possible reason why job satisfaction, affective commitment, and turnover intentions were linked to job performance is based on equity theory (Adams, 1965). Job performance is concerned with the effectiveness with which job incumbents perform activities that contribute to the organisation's technical core (Borman & Motowidlo, 1997). Consistent with equity theory, employees who perceive they have high job satisfaction and affective commitment might increase their performance. In addition, workers who intend to leave the organisation might reduce their performance.

The longitudinal results, however, showed that only affective commitment was linked to job performance, highlighting that a six-month time lag was sufficient to detect the effect of affective commitment on job performance. A possible reason why affective commitment was associated with job performance across time is dependent on the conceptualisation of affective commitment. As discussed earlier, affective commitment is defined as the relative strength of an employee's identification with and involvement in their organisation. Feelings of attachment to and identification with their organisation might lead to the setting or acceptance of goals that are compatible with organisational objectives. This result also related to the social exchange relationship that involves the exchange of socio-emotional benefits. Individuals form social exchange relationships to the extent that they receive worthwhile benefits and that these benefits are assigned in a fair manner (Cropanzano, Rupp, Mohler, & Schminke, 2001). Social exchange relationships emphasise the obligations, attachments, and identification that employees feel toward their organisation. When employees form social exchange relationships with organisations, they tend to have higher job performance (i.e. employees reciprocate with affective commitment, which leads them to strive harder to achieve organisational goals). Thus, affective commitment might reflect social exchange.

Job satisfaction and turnover intentions were not associated with job performance over the six-month lag. Hence, job satisfaction and turnover intention only had an immediate relationship but not a longer effect on job performance. I presume that the effects of job satisfaction and turnover intentions on job performance may be dissipate over a longer time interval. As stated earlier, job satisfaction and turnover intentions were linked to job performance at both Times 1 and 2. However, the relationships between job satisfaction and turnover intentions with job performance did not continue over time. It is noteworthy that the time intervals in the current study were quite long. Research still has to explore whether stronger effects emerge for shorter intervals (e.g., a few days or a few weeks). More theoretical and empirical work on the temporal characteristics of the relationships between job satisfaction and turnover intentions with job performance are necessary to help researchers choose optimal time intervals for these relationships.

The current study also highlights that the relationships between work attitude variables and job performance vary. For instance, the cross-sectional findings demonstrated that the affective commitment – job performance relationship was stronger than the job satisfaction – job performance relationship. On one hand, this result emphasises that affective commitment is a stronger predictor of job performance. As mentioned above, affective commitment refers to the employee's emotional attachment to, identification with, and involvement in, the organisation (Meyer & Allen, 1997). Employees with a strong affective commitment continue employment with the organisation because they want to do so. Thus, affectively committed employees direct their attention to aspects of their work performance they believe to be valued by and valuable to the organisation (Meyer & Allen, 1997). As a result, high affective commitment was strongly related to high job performance.

On the other hand, there was a relatively low relationship between job satisfaction and job performance. Perhaps job satisfaction among these technical workers is based on extrinsic satisfaction rather than intrinsic satisfaction. Extrinsic satisfaction refers to the degree of satisfaction an employee has with work conditions, policies and benefits which are unrelated to the job itself. Employees' satisfaction with the reward system, promotion, organisational policy, and the

quality of interpersonal relation aspects of their jobs are all affected by external factors. If job satisfaction in present sample was due mainly to extrinsic factors, then it may not have been linked directly with job performance. Another plausible reason for these findings is based on the argument that job performance causes job satisfaction (see Riketta, 2008). Supporting this view is that job performance often leads to internal and external rewards (e.g., pay, recognition, feeling good at work), which in turn may foster positive job attitudes such as job satisfaction (e.g., Lawler III & Porter, 1967). Additionally, in a collectivistic culture, job satisfaction may be has a lesser determinant of job performance compared to group norms or collective goals (Earley & Gibson, 1998). Collectivists' job performance may be best predicted by norms, duties, and obligations rather than job satisfaction (e.g., Thomas & Pekerti, 2003). Job satisfaction may also play a much lesser role in determining job performance in collectivist, high power distance culture (e.g., Malaysia) because they expect to be told what to do and how to do their jobs by authority figures (Hofstede, 1991). Nevertheless, in a collectivistic, high power distance culture, dissatisfied employees may still feel the need to perform well to contribute to the group objectives (e.g., Ng, Sorensen, & Yim, 2009). As a result, the relationship between job satisfaction and job performance is only relatively low.

In conclusion, the current study suggests that job satisfaction and turnover intentions were linked with job performance in the cross-sectional analyses but not in the longitudinal analyses. More theoretical and empirical work on the temporal characteristics of the relationships between job satisfaction and turnover intentions with job performance is necessary to help researchers identify optimal time intervals for the relationships to occur. The current study also suggests that affective commitment was associated with job performance in both the cross-sectional and longitudinal analyses.

Moderating effects of job control

Although the main effects of job control (i.e. timing control, methods control, and skill discretion) were as predicted, the interaction effects between job demands and job control on psychological strain were not supported. Only two interaction effects were significant in the cross-sectional data and only one interaction in the

longitudinal data. Perhaps most importantly, the interactions contradicted the buffering hypothesis of the Job Demands-Control (JDC) model (Karasek, 1979). The JDC model proposes that a combination of high job demands and high job control leads to motivation, learning, and personal growth (Karasek & Theorell, 1990). However, the results of my Time 1 cross-sectional and longitudinal analyses (see Table 10.4) showed that Karasek's model did not apply in the collectivist culture of Malaysia with its high power distance.

Contrary to the JDC model, the combination of high job demands and job control (i.e. methods control and decision authority) led to higher levels of social dysfunction among technical workers in the cross-sectional analyses. In contrast, workers did not experience greater social dysfunction when methods control or decision authority was low. The longitudinal analyses also found that the higher decision authority aggravated the effects of high job demands on anxiety/depression. These results suggest that in the Malaysian context, technical workers in *high* demand jobs may actually prefer less control. One plausible reason for this result is that perhaps these technical workers perceived that high job control would increase their level of responsibility. That is, if they have high job control, their job demands also would increase.

Table 10.4. Summary of results for the moderating effects of job control variables

Interaction	Time 1		Time 2		Longitudinal	
	A/D	S/D	A/D	S/D	A/D	S/D
JD x TC						
JD x MC		√				
JD x SD						
JD x DA		√			√	

Note. A/D = anxiety/depression; S/D = social dysfunction; JD = job demands; TC = timing control; MC = methods control; SD = skill discretion; DA = decision authority

Another possible explanation is that these technical workers expect to be told what to do by their superiors to a greater extent than their Western counterparts. The Malaysian style of collectivism is that individuals do not have the authority to make decisions in the organisation (Lim, 2001). Malaysian collectivism implies that one perceives the self as part of a group while accepting power and status inequalities within the group (Triandis, 1995). Thong and Jain (1987) argued that

decision-making in Malaysian companies remains a prerogative of managers. In addition, a high power distance culture is based on a hierarchical relationship within organisations. Each member of an organisation has a position associated with his or her rank, title or status. This position signifies the power one holds in the organisation (Ahmed, Mouratidis, & Preston, 2009). In high power distance countries, like Malaysia, individuals tend to value hierarchy, and this means that they are more likely to show respect for superiors and expect them to take the lead (Abdullah, 2005, p. p.215). In the Malaysian context, employees expect to follow instructions from top management. Therefore, although the technical workers have the authority to control their job, they generally may still expect to be told what to do by their supervisors. In other words, perhaps these technical workers place little importance on personal control and may actually prefer to have less rather than more control.

In conclusion, job control variables did not function to reduce the effect of job demands on psychological strain among these technical workers in Malaysia. Instead of buffering effects, there is evidence that methods control and decision authority aggravated the relationship between job demands and psychological strain. Consequently, job control variables (e.g., timing control) have direct effects on strain but have no moderating effects.

Moderating effects of social support

I also assessed the moderating effect of social support using the Job Demands-Control-Support (JDCS) model as a theoretical framework. I distinguished three different sources of social support: perceived organisational support (POS), supervisor support and co-worker support. Halbesleben and Buckley (2004) argued that research on buffering effects of social support has been inconclusive. The JDCS model (Karasek, 1979; Johnson & Hall, 1988) has been interpreted in several ways (Grant & Parker, 2009; van der Doef & Maes, 1999). Some studies have shown that social support reduces the negative psychological and physical health effects of job demands, others have found a three-way interaction suggesting that social support is more likely to exert these buffering effects when job control is lacking, and still others have identified no buffering effects of social support (Grant & Parker, 2009). As will be discussed, the present study also did

not find substantive interactions between job demands, job control, and social support (see Table 10.5).

Table 10.5. Summary of results for the moderating effects of social support

Interaction	Time 1		Time 2		Longitudinal	
	A/D	S/D	A/D	S/D	A/D	S/D
JD x POS						
JD x SS		√		√		
JD x CS						
JD x TC x POS						
JD x MC x POS						
JD x SD x POS						
JD x DA x POS						
JD x TC x SS		√				
JD x MC x SS						
JD x SD x SS						
JD x DA x SS		√				
JD x TC x CS						
JD x MC x CS						
JD x SD x CS						
JD x DA x CS						

Note. A/D = anxiety/depression; S/D = social dysfunction; JD = job demands; TC = timing control; MC = methods control; SD = skill discretion; DA = decision authority; POS = perceived organisational support; SS = supervisor support; CS = co-worker support.

The results of the cross-sectional analyses only partially supported my hypotheses, and the longitudinal analyses did not support them at all. As shown in Table 10.5, only four out of 60 interaction effects involving social support variables in the cross-sectional analyses were significant. Interestingly, all four significant interaction effects were found for social dysfunction, whereas none were found for anxiety/depression, and none of the longitudinal moderator effects were significant. A possible explanation for this result is based on Frese's (1999) argument that social support should function as a buffer more regularly in relation to a social type of dysfunctioning than a non-social type of psychological functioning. For example, a person who reacts to stressors with an outburst

against others may show less of this response when he or she receives social support. Applied to my study, this would suggest that social support would more strongly moderate the effect of job demands on social dysfunction than on anxiety/depression. Social dysfunction is, by definition, an outcome that refers to a disturbance in social situations, whereas anxiety/depression refers to individual's general emotional reactions to stressful experiences (often non-social).

In terms of the two-way interaction analyses, this study illustrated that only two out of 12 interactions were significant (especially in the cross-sectional analyses). These findings showed that supervisor support moderated the relationship between job demands and social dysfunction, and confirm previous research that supervisor support moderates the effects of job demands on psychological strain (e.g., Cooper, et al., 2001; Peeters & Le Blanc, 2001). A possible explanation of this result is that supervisor support may help individuals to cope with their job demands. Supervisor support may prevent job demands from exerting an impact on psychological strain; that is, it may buffer against the adverse effects of stressors and work demands at work (e.g., Cooper, et al., 2001; Viswesvaran, et al., 1999). Supervisors may also aid employees experiencing high job demands by providing emotional support, advice and offering practical assistance with work problems that increase employee affect.

However, POS and co-worker support did not buffer the relationships between job demands and psychological strain. Perhaps POS and job demands might have been interconnected. As discussed earlier, POS was negatively associated with social dysfunction. Thus, it is possible that POS has a direct effect rather than moderating effects among technical workers. POS simply means recognition by the organisation of an employee's socioemotional needs, efforts, commitment, and loyalty (Jain & Sinha, 2005). Based on this conceptualisation, technical workers may perceive that they should perform their tasks successfully in order to get recognition from their organisation. Consequently, POS could not interact with job demands to reduce or prevent psychological strain because POS might have been perceived as a source of extra demand (i.e. employees may feel they have to reciprocate by performing at a higher level if they receive support from their organisation).

Furthermore, a possible reason why co-worker support did not function to assist technical workers in dealing with job demands in relation to psychological strain may lie in the nature of technical work that requires them to work outside the organisation in order to provide technical support for customers. Therefore, assistance from co-workers in terms of information, physical, and emotional might not help to overcome job demands experienced by the technical workers. As a result, co-worker support failed to reduce the effects of job demands on psychological strain. It is also plausible that perhaps co-worker support has a direct effect rather than moderating effect.

Concerning the three-way interactions, only two out of 48 of the interactions effects were significant in the cross-sectional analyses, particularly at Time 1. Specifically, at Time 1, the combination of job control (specifically, timing control and decision authority) and supervisor support may help employees to cope with demands and reduce or prevent psychological strain. These provide a little support for the JDACS model in Malaysia, particularly at Time 1. The longitudinal analyses, however, found that none of the two- and three-way interactions were significant. These findings demonstrated lack of support for the JDACS model in the longitudinal analyses. However, the major contribution of this study is to stimulate thought on the importance of considering multiple influences from the psychosocial work environment on employee outcomes (Karasek, 1989). Both main and moderating relationships highlight the importance of considering multiple influences on employee outcomes. In addition, the time lag was only six months, which may not be time enough to reduce social dysfunction as a result of the interaction of job demands and social support. Perhaps the effects of social support are also very short term. That is, social support does not buffer the relationships between job demands and psychological strain over time.

In conclusion, the findings suggest that only supervisor support functioned as a moderator in the relationships between job demands and social dysfunction in the cross-sectional analyses. Also, the current study provides only a little support for the JDACS model. This study suggests that the direct effects of social support may be more substantive than its moderating effects.

Moderating effects of self-efficacy

While self-efficacy had main effects on the psychological strain components, I also found interaction effects involving self-efficacy based on both the cross-sectional and longitudinal analyses. These results suggest that high levels of self-efficacy may indeed help employees cope more effectively with high job demands. Specifically, the current results showed that technical workers with high levels of self-efficacy might not react as negatively to high job demands as those with low self-efficacy.

The results of the current study corroborate previous studies in western contexts (e.g., Jex, et al., 2001; Jex & Gudanowski, 1992; Judge & Bono, 2001; Schaubroeck & Merritt, 1997; Siu, Spector, Cooper, & Lu, 2005) and might be attributed to the fact that individuals with high levels of self-efficacy tend to use problem-focused coping strategies at work (Semmer, 2003), which are effective in coping with job stressors. Problem-focused coping consists of efforts to alter the impact of a stressor, as when we seek information about what needs to be done and change either our own behaviour or take action to modify the environment (Lazarus, 1995). As discussed previously, self-efficacy refer to people's beliefs about their capabilities to exercise control over events that influence their lives (Bandura, 1989) and their beliefs in their capabilities to mobilize the motivation, cognitive resources, and course of action needed to exercise control over task demands (Bandura, 1995). Thus, self-efficacy beliefs concern not only one's skill but also judgements that one have a capability to do their tasks (Bandura, 1986). Bandura (1977) argued that "people process, weigh, and integrate diverse sources of information concerning their capability, and they regulate their choice behaviour and effort expenditure accordingly" (p. 212).

In the current study, it could be argued that self-efficacy protected employees from the negative effects of job demands. As explained by Gist and Mitchell (1992), individuals with high self-efficacy tend to persist in the face of job-related obstacles. Individuals with high levels of self-efficacy might use coping methods that prevent stressors from occurring in the first place (Jex, et al., 2001). This finding is also in line with Lazarus and Folkman's (1984) notion that individual differences affect the way people respond to stressful events in their environment by influencing the manner in which they appraise stressors and/or the effects these

stressors have on psychological strain. Lazarus (1991) also noted that an individual's cognitive appraisal processes influence the effect of environmental events on his or her psychological health. If a person has a strong belief in his or her ability to control events, he or she will probably appraise a stressor (e.g., job demands) as a challenge. A strong sense of self-efficacy seems to reduce the likelihood of negative appraisals of stressful job demands, and, as a consequence, it provides protection against psychological strain. These findings are congruent with what is known about self-efficacy (Bandura, 1997). An employee who perceives himself or herself to be competent, or who has high self-efficacy, is probably not as likely to view high job demands as being threatening as is an individual with low self-efficacy.

The salient finding of the current study is also that individual differences in self-efficacy might buffer against strains regardless of the cultural context. The current study reinforces the argument by Lazarus (1995) that self-beliefs function similarly in different cultures, and self-efficacy has been conceptualised as a universally relevant construct (Bandura, 1997), although some researchers have suggested that self-efficacy reflects individualistic, Western values and that the moderating effects of personal self-efficacy are more evident in individualistic cultures (e.g., Schaubroeck, et al., 2000). Bandura (1997) argued that high sense of self-efficacy is important to collectivists and individualists. In a collectivist culture, people work together to produce the benefit they seek. Collectivists are respected for their personal contribution to group accomplishments and prefer to set goals for themselves that are related to promoting the welfare of their in-group (Bandura, 1997). Therefore, they are likely to put their personal capabilities to the best collective use. Group achievements and social change are rooted in self-efficacy (Bandura, 1997). Collectivists are most efficacious and productive when they manage things together (Bandura, 1997). The current study also corroborates a study by Siu and colleagues (2005), where self-efficacy buffered the impact of strain among Chinese respondents.

However, the magnitude of the interaction effect of self-efficacy was rather low. For example, the moderating effect of self-efficacy only contributed 1-3% variance in relationships between job demands and anxiety/depression. Nevertheless, Evans (1985) concluded that moderator effects are so difficult to

detect that even those explaining as little as one percent of the total variance above the main effects should be considered important. In addition, Champoux and Peters (1987) reviewed much of the relevant literature and reported that field study interactions typically account for an additional 1-3% of criterion variance (see also McClelland & Judd, 1993).

In conclusion, the current study suggests that self-efficacy functioned as a moderator in the relationship between job demands and psychological strain in both the cross-sectional and longitudinal analyses.

Mediation effects

I conducted mediation analyses to test whether (a) psychological strain mediated the relationships between work design and work attitude variables, and (b) work attitudes mediated the relationships between psychological strain and job performance. In the cross-sectional analyses, the current study provides some support for psychological strain as a mediator of the relationships between work design and the criterion variables. The results demonstrated 15 out of 30 mediational routes for the mediation effect of anxiety/depression and five out of 30 for the mediation effect of social dysfunction. The results of the cross-sectional analyses also provided support for the mediation effect of work attitudes in the relationships between psychological strain and job performance, revealing seven out of 12 mediational routes for the mediation effects of work attitudes.

On the other hand, the longitudinal analyses provide little support for the mediation effects of psychological strain – only four out of 15 mediational routes for the mediation effect of anxiety/depression and only three out of 15 for the mediation effect of social dysfunction. In addition, the longitudinal results did not provide support for the mediation effects of work attitudes in the relationships between psychological strain and job performance. In other words, job satisfaction, affective commitment and turnover intentions failed to function as mediators in the relationships between psychological strain and job performance over a six month lag.

The mediation effects of psychological strain. In brief, both cross-sectional and longitudinal analyses indicated that psychological strain functions as a mediator in

the relationships between work design and work attitude outcomes (i.e. job satisfaction, affective commitment, and turnover intentions). Nevertheless, the results of cross-sectional analyses provide stronger evidence than the longitudinal analyses. The cross-sectional analyses illustrated that anxiety/depression mediated the relationships between job demands, methods control, and skill discretion with job satisfaction, affective commitment, and turnover intentions. Social dysfunction only mediated the relationships between methods control with job satisfaction, affective commitment, and turnover intentions. The key finding of the current study is that anxiety/depression works better as a mediator than does social dysfunction. These results seem to suggest that the work design variables are more likely to affect anxiety/depression than social dysfunction. For example, the current study found that job demands, timing control, methods control and skill discretion were more strongly related to anxiety/depression than social dysfunction, which in turn affects job satisfaction, affective commitment, and turnover intentions.

This study corroborates previous studies that job demands and job control appear to first negatively influence strain (e.g., anxiety/depression), which then results in reduced levels of job satisfaction, affective commitment and increased levels of turnover intentions (Podsakoff, et al., 2007; Stewart & Barling, 1996). One possible explanation for these results is that higher levels of job demands and lower levels of job control variables result in decreases in cognitive energy, confidence, and task persistence and these signs of anxiety/depression affect work attitudes – for example, job satisfaction, affective commitment and turnover intentions. Lazarus and Folkman (1984) also suggested that work stressors (e.g., stimuli that place demands on individuals) are appraised as hindrances, and result in strain. Consistent with expectancy theory (Vroom, 1965), the results of this appraisal translate to differing effects on work attitudes such as job dissatisfaction, lack of commitment and high turnover intentions. Also, the conceptualisation of anxiety/depression and social dysfunction may be responsible for these findings. As stated earlier, anxiety/depression reflects a broader dimension such as being unhappy and depressed whereas social dysfunction reflects only a social aspect of strain. As a result, job demands and job control may be more related to anxiety/depression rather than to social dysfunction.

The longitudinal analyses, however, revealed that anxiety/depression only mediated the effects of job demands and timing control on affective commitment and turnover intentions. As discussed earlier, only job demands and timing control predicted anxiety/depression over a six month lag. Methods control, skill discretion, and decision authority were not associated with anxiety/depression over time. As a consequence, only job demands and timing control were linked to anxiety/depression after six months, which in turn influenced affective commitment and turnover intentions. In addition, social dysfunction only mediated the effect of job demands on job satisfaction, affective commitment and turnover intentions over time. Thus, high job demands were linked to social dysfunction, which in turn reduced job satisfaction and affective commitment, and increased turnover intentions after six months lag.

The findings of the study also emphasise that the relationships between job demands and the work attitude variables were consistently mediated by both anxiety/depression and social dysfunction over time. These results support the idea that job demands have an impact on both psychological strain dimensions and an indirect effect on the outcomes of strain over time (i.e. reduced affective commitment and increased turnover intentions). Thus, the evidence of mediation effects concerning the impact of job demands on outcome variables has supported the idea that psychological strain is a key mediating variable in the relationship between job demands and work attitude variables.

This study provides evidence that highlights the importance of psychological strain in mediating the relationships between work design and the outcome variables. Psychological strain (especially anxiety/depression) appears to be a mechanism between work design variables and the work attitude outcomes. The mediation effects of psychological strain on the relationships between work design and work attitude variables provided support for the conceptualisation of work attitudes as consequences emerging from the impact of work design on psychological strain, especially in the short term.

The mediation effects of work attitude variables. Overall, there were relatively few significant mediation effects of job satisfaction, affective commitment and turnover intentions in the relationships between the psychological strain

dimensions and job performance. Interestingly, there were different patterns for cross-sectional analyses versus longitudinal analyses. The cross-sectional analyses provided support for mediation effects of job satisfaction, affective commitment and turnover intentions. Specifically, job satisfaction mediated the effect of social dysfunction on job performance, whereas affective commitment mediated the effects of both anxiety/depression and social dysfunction on job performance. Turnover intentions only mediated the effect of anxiety/depression on job performance.

These results confirm that technical workers consistently experiencing strain may experience job dissatisfaction, lack of affective commitment and increased turnover intentions, which in turn reduce job performance. The present findings also confirm the nature of the mechanisms underlying the effects of work design on job performance as recommended by Parker and Wall (2001). This study highlights that job satisfaction, affective commitment and turnover intentions have considerable merit in explaining the relationship between psychological strain and job performance. Support for these psychological mediating processes provides insight into the likely processes unfolding as individuals experience strain at work. Consistent with the transactional model (Lazarus & Folkman, 1984), stressed employees' responses to their stressful experience, including job dissatisfaction, lack of affective commitment and intention to leave the aversive job situation, which in turn reduced job performance. As mentioned earlier, psychological strain is a consequence of work design variables such as job demands and job control variables. Feelings of strain among technical workers led to lower feelings of job satisfaction and affective commitment and higher feelings of turnover intentions, which in turn reduced job performance.

Another plausible explanation is that employees with high job satisfaction, affective commitment and low turnover intentions will perform better in their job. This is consistent with social-cognitive theory (Ajzen, 1991) that attitudes toward the job (e.g., job satisfaction and affective commitment) would influence behaviours on the job (e.g., job performance). Furthermore, the mediation effect of turnover intentions is consistent with equity theory (Adams, 1963), suggesting that workers who feel stressed enough to want to leave the organisation might reduce their output to compensate for the feelings of distress. The cross-sectional

analyses provide support for the theoretical tenet that job satisfaction, affective commitment, and turnover intentions caused by psychological strain tend to contribute to reduced job performance.

The longitudinal analyses, on the other hand, did not show any significant mediation effects of job satisfaction, affective commitment, and turnover intentions in the relationships between the psychological strain dimensions and job performance. One possible reason of these results may be that anxiety/depression and social dysfunction have relatively shorter-term effects on work attitude variables. As discussed earlier, it is possible that the effects of psychological strain on job satisfaction, affective commitment, and turnover intentions will dissipate over a longer time (i.e. six months). According to Lazarus' (1966) theory, one develops coping strategies towards stressors (e.g. denial or help seeking) which reduce feelings of strain. Thus, after six months, a technical worker may deal with his or her feelings of strain. I also presume that the impact of anxiety/depression and social dysfunction is more short term rather than long term. These findings warrant further investigation on the temporal characteristics to help researchers choose optimal time intervals for psychological strain to show effects on work attitudes.

Additionally, more theoretical and empirical work on the temporal characteristics of the work attitudes-job performance relationship is also necessary. As in the cross-sectional analyses, this study showed that work attitudes mediated the effects of psychological strain on job performance. This result suggests that work attitudes have a simultaneous mediation effect but not a longer term effect. One possible reason for these results is that perhaps a six-month time lag is too long and might dissipate the effects of work attitudes on job performance. Accordingly, job satisfaction, affective commitment and turnover intentions did not function as mechanisms in the longitudinal analyses. More research needs to be done to better understand this finding. In theory, panel designs require that the time between two measurement waves matches the time that the effects under investigation presumably take to emerge. However, little is actually known about this process (e.g. how long it takes for job satisfaction to show an effect on performance) (see Riketta, 2008).

Theoretical and Methodological Implications

This study has several important implications for theoretical perspectives. First, this study provides information concerning the JDC model and its extension in the collectivist with high power distance Malaysian culture. As far as I know, this is the first study of the JDC model in Malaysia, and one of very few in Eastern countries. My research is inconsistent with Xie's (1996) finding showing the generalisability of the JDC model in a Chinese sample. In light of this inconsistency, it should not be assumed that findings from Western European countries also generalise to culturally dissimilar regions of the world such as Asia. This study emphasises that collectivism in Malaysia does not necessarily mean the same as it does in China or other Asian countries. Malaysia is a pluralistic society consisting of 54 percent Malays, 25 percent Chinese, 7.5 percent Indians and 13.5 percent others. Malaysians set great store by the Confucian values of collectivism, filial piety, harmonious relationships and importance of giving face (Mansor & Ali, 1998). However, about 60 percent of the population are Muslims and so management practices are also based on Islamic principles. Therefore, Malaysian practices should be understood in the context of Confucian values, Islamic values, and Western values. Also, some Japanese personnel practices are in line with the Malaysian value system (Mansor & Ali, 1998). There is reluctance on the part of management, for example, to fire workers who do not perform or during bad times.

Malaysians also appear to have higher uncertainty avoidance (Lim, 2001). This is manifested in some changes in organisational practices. For example, Malaysians are looking for ways to ensure higher stability and lower variability in business through the creation of rules. Most organisations have a very formal system based on a rational-legal system (Mansor & Ali, 1998). Authority is defined according to positions and is hierarchical in nature. The formal relationship at work is very much maintained. Therefore, researchers must be careful to address the unique characteristics of the particular group and culture under investigation. Replicating the present study in other collectivist, high power distance cultures would be valuable to confirm the present findings. For example, it would also be of interest to investigate whether a sense of collective control over the work environment is

more salient than individual autonomy in some circumstances, especially for people in collectivist societies.

The second implication concerns the specification of job control variables. In the current study, I measured multiple facets of job control (i.e. timing control, methods control, skill discretion, and decision authority), which represent a much broader construct than Karasek's (1979) JDC model. As argued by Sargent and Terry (1998), use of a global index of control may mask the impact of some forms of control. From my research, certain aspects of job control are highlighted as having effects on strain. This highlights that the operationalisation of job control should match the theoretical construct and the measure used in the research. Future research should consider more precise operationalisation of job control variables.

This research also highlights that additional variables such as the cultural context or individuals' positions in their organisations may influence the moderating effect of job control variables. Contrary to the JDC model, the current study suggests that methods control and decision authority aggravate the relationship between job demands and strain among technical workers (i.e. reverse buffering). This finding suggests that job control variables do not necessarily buffer the effects of job demands on strain among these technical workers.

The current research also highlights that the main effects of job control variables were more substantive than the moderating effects. Hence, the direct effects of job control variables on psychological strain were more important than the moderating effects of job control variables in the relationship between job demands and psychological strain. In addition, this study suggests that different facets of job control had direct effects on psychological strain. For example, timing control, methods control, and skill discretion were related to anxiety/depression, whereas decision authority was not. Thus, this research suggests that future research may possibly test the effects of distinct dimensions of job control.

The next theoretical implication is the understanding of how individual differences can affect the relationship between job demands and psychological strain. The strong direct and moderating effects of self-efficacy suggest that self-

efficacy may be as relevant for collectivist Malaysian culture as it is for Westerners. This study supported Bandura's (2001, p.16) argument that "perceived efficacy is valuable not because of a reverence for individualism but because a strong sense of perceived efficacy is vital for success, regardless of whether it is achieved individually or by group members working together". Perceived self-efficacy contributes to productive functioning among members of collectivist cultures just as it does to people raised in individualistic cultures (Earley, 1994). However, people from collectivist cultures judge themselves most efficacious and work most productively under a group-oriented system (Bandura, 2001). Triandis (1989) also noted that collectivists focus on the collective aspects, such as collective efficacy. A strong sense of collective efficacy may contribute to both a positive interpersonal climate and greater cooperation and helping among group members (Jex & Bliese, 1999). This positive interpersonal climate may buffer the effects of stressors by providing group members with emotional support during stressful periods (Cohen & Wills, 1985), and may have a buffering effect by providing group members with the means necessary to reduce stressors (Beehr, 1995). The findings suggest that individual psychological differences should be considered when implementing interventions aimed at improving employees' well-being.

Another theoretical implication is relating to the role of social support. The current study shows that it is worthwhile to consider the different sources of social support. Consistent with Sarason, Sarason, and Pierce (1994), I found that the effects of receiving social support are affected by the nature of the relationship between the support-giver (organisation, supervisor, or co-worker) and the support-receiver (employee). For instance, this study found that only supervisor support was relevant to technical workers as a moderator; co-worker support and POS were not. Support from supervisors is perhaps important to help manage subordinates' work characteristics (e.g., job demands). Additionally, the current study has an implication for the JDCA theory. In particular, it highlights the need to carefully consider levels of job demands, job control and social support simultaneously.

Also consistent with Karasek's ideas, social support was shown to have main effects on strain. In most of Karasek's writing, no differentiation is made between

effects associated with support from supervisors and those associated with co-worker support and perceived organisational support. My research suggests that these three sources of support should be clearly distinguished in tests of Karasek's model. The current research also highlights that the direct effect of social support on strain is more substantive than its moderating effects. In addition, my research emphasises that supervisor support and co-worker support have a short term effect, whereas POS has a long term effect on strain.

Another theoretical implication concerns the job design process. The findings of the current research might help to identify intervention points in the process by providing a sequence of events. This sequence of event may help researchers investigate phases of change in how work design influences psychological well-being in the workplace. For example, the current study investigated the consequences of the psychosocial work environment on feelings of strain, which in turn influence work attitudes such as job dissatisfaction, lack of affective commitment, and increase turnover intentions. In addition, these work attitudes reduce job performance. Theoretically, different phases have different intervention components. Accordingly, the mediation analyses in this study are useful for researchers seeking to identify the critical components of an intervention (MacKinnon & Dwyer, 1993).

The current research also highlights that short-term effects are more evident than long term effects. For instance, psychological strain only had an immediate relation with the criterion variables (i.e. job satisfaction, affective commitment, turnover intentions, and job performance). In addition, job satisfaction and turnover intentions had an immediate effect on job performance. However, affective commitment had both immediate and long-term effects. Therefore, this study suggests that future research on the temporal characteristics of the relationships between the variables is necessary to identify optimal time intervals between Time 1 and Time 2 data collection.

Finally, my research supports the previous literature that emotions exert a direct and powerful influence on individual strain (Russell, 2003). Emotions are subjective experiences that are associated with feelings, mood, and attitude (Scherer, 2005) and are presumed to monitor and regulate the effects of

individual's cognitive appraisal of person-environment fit (Scherer, 2004). The current study suggests that psychological strain only had an immediate relation with the criterion variables (i.e. job satisfaction, affective commitment, turnover intentions, and job performance). In the long-term (e.g., six months) these effects had dissipated. As discussed by Liu and Spector (2005), people in high power distance cultures tend to use emotion regulations as a coping strategy to reduce unpleasant affective reactions. For example, they are likely to use psychological mechanisms such as rationalisation and denial (Liu & Spector, 2005). By using rationalisation, they view the unsatisfying fact as "this is what it ought to be". By using denial, they simply deny the stressful incident happened at work. Hence, emotions should be incorporated in studies of the impact of psychological strain to examine their regulating effects on people's reactions to stressful work environments.

Managerial Implications

The current research has several major implications for human resource management practitioners. First, the results of my research suggest that work design aspects (e.g., job demands and job control) were related to persistent strain among employees. Thus, care should be taken by human resource management practitioners to "fit" a work environment to their occupants. Job demands and job control provide a useful basis for redesigning jobs in order to enhance well-being among employees. The current study revealed that high job demands were associated with psychological strain. Based on these findings, managers should be alert for signs of employees suffering from high job demands. Symptoms of high job demands may include absence from work, being late for appointments, missing deadlines, being mistake prone, or undergoing a noticeable change of appearance (Cummings, 2001). When these symptoms appear, management interventions, such as talking the issues out with employees, are likely to be beneficial. Talking regularly with employees about job demands and helping them to prioritize tasks may ultimately result in greater productivity. Careful scheduling of all activities an individual needs to accomplish, including personal quality time, may help facilitate productivity and, at the same time, reduce perceptions of high job demands.

Second, the current study showed that technical workers in Malaysia may perceive that job control (especially decision authority) is less important. As mentioned earlier, people in a high power distance culture expect to be told what to do and how to do their jobs by their supervisor. This is because they feel obligated to follow rules and directives from their top management (e.g., Kakar, 1978). Malaysians, particularly the Malays, were traditionally very loyal to the leader. To question or speak up might be seen as an inappropriate challenge and rude to a leader, leading to increased rather than decreased stressors. For them, managers should provide concrete direction and guidance in their organisation. Therefore, training managers need to provide more tangible direction and guidance as a possible effective way to diminish strain among these technical workers.

Third, my study suggests that augmenting the social support of employees is one way to reduce feelings of psychological strain. The findings indicated that social support can directly reduce strain. Managers should strive to value employees' contributions, act in their best interests, show concern, and help employees when they need it, to enhance employees' perceptions of organisational support. Moreover, a priority of managers should also be to teach employees about the potential assistance available through support systems in their organisation. For example, Heaney, Price, and Rafferty (1995) conducted a study among human service workers to help to develop the skills and concepts necessary for enhancing and making fuller use of their existing social relationships. By mapping and diagnosing the strengths and weaknesses of their own social networks, participants in the experimental group explored how social support from others might help solve problems at work. Further, they worked on refining the interpersonal skills associated with exchanging social support with others, including clarifying misunderstandings, providing constructive feedback, and asking for help from others. Results indicated that the intervention enhanced a positive work team climate.

Fourth, my research suggests that human resource management practitioners would do well to consider the individual differences among their employees when redesigning their organisation. My research suggests that self-efficacy has a beneficial effect on employee well-being. Although there have been suggestions

that self-efficacy may hold less relevance for collectivist cultures (Markus & Kitayama, 1991; Schaubroeck, et al., 2000), the results of this study suggest that it would be inappropriate to dismiss self-efficacy as a predictor of job strain among Malaysian employees. The most benefit to be gained in terms of increases in levels of psychological strain appears to be among employees low in self-efficacy. On the basis of the extant literature, job-related and health-related behaviour training in coping mechanisms might also be useful for such employees. Managers in collectivist cultures can use the findings from this study to develop interventions to improve the quality of the working life of their employees through fostering a strong sense of self-efficacy.

Attempts to enhance self-efficacy seem to be one especially important mechanism for promoting well-being in organisations. This may be done through training, goal setting and on-the-job coaching (Bandura, 1997). Training efforts focused on self-management and supportive supervisory practices, such as providing contingent positive feedback, have proven to be effective in building self-efficacy (Gist & Mitchell, 1992). Moreover, training focused on group level information is highly effective in enhancing efficacy expectations among collectivists (Earley, 1994). Malaysian employees with high self-efficacy may be able to tolerate (and actually desire) higher levels of job demands. Employees and supervisors could be encouraged to view high self-efficacy as an asset that helps them deal with work conditions that are typically stressful. As noted by Mischel and Northcraft (1997), enhancing individual task skills and teamwork promotes collective efficacy beliefs, as does a better understanding of work-group interdependencies.

Maddux and Lewis (1995) discussed strategies for enhancing self-efficacy and gave several recommendations to developers of self-efficacy directed interventions. There are four information sources of self-efficacy beliefs, including enactive mastery experiences, vicarious experiences, verbal persuasions, and affective states (Bandura, 1997). Enactive mastery experiences serve as direct indicators of capability. For example, success at a task strengthens self-efficacy expectancies for that task, whereas perceptions of failure diminish self-efficacy expectancy (Maddux, 1995). Thus, it is essential to induce the experience of success to enhance employees' self-efficacy. To achieve this, the first step in a training program must be aimed at giving employees the necessary skills to cope

with the stressful situations in their organisation. For example, an experienced employee would share how they handle the stressful situation in his or her organisation. In addition, employees could watch a video showing employees who handle stressful situation in their job successfully (vicarious experience). After the employees are taught the necessary know-how to handle the stressful situations, they could perform the new skills in a role-play for a stressful situation in order to experience their mastery at handling such problems. Video-recordings could be used to chart their successes and failures and allow experienced employees to give feedback. After the employees have experienced mastery at handling stressful situations in the practice situations and after experienced employees have persuaded them of their efficacy, they might be able to handle their own problems with more confidence in their abilities to manage job strain.

Lastly, my research suggests the need for designing interventions to deal with high job demands and manage job strain. Practically, it may be difficult to reduce the levels of job demands because these may well constitute the core of one's task. Accordingly, secondary interventions can be carried out to reduce or manage job strain (Cooper, Dewe, & O'Driscoll, 2003). For example, interventions at the individual level are important to help employees manage and prevent job strain. Such interventions would focus on increasing the resistance of people to work stressors (e.g., job demands). The main focus of interventions has been on people instead of the job context (Quick, Quick, Nelson, & Hurrell, 1997). Organisations and their managements can promote programs aimed at helping individuals cope with daily stresses. For example, in Malaysia, organisations could implement religious activities such as stress management from an Islamic perspective. This could strengthen employees' belief in God as one coping strategy to help deal with their daily stress. In high power distance cultures, changing oneself (emotion-focused coping) is a more feasible method for high power distance members to deal with stressful situations (Liu & Spector, 2005). Thus, religious activities could help employees to manage their emotions by having the ability to rationalise stressful situations. In addition, stress management training such as relaxation, meditation, and biofeedback might also be effective to reduce strain.

Strengths and Limitations of the Study

While the present study benefits from a longitudinal design, it is nevertheless vulnerable to potential weaknesses that should be discussed. One of the key strengths in my research is that I addressed methodological limitations that researchers have suggested might be responsible for the mixed findings of past research on the JDC model (Sargent & Terry, 1998, 2000). Most importantly, my longitudinal study measured outcomes at more than one time, enabling me to examine the role of job demands, job control, social support and self-efficacy on the psychological strain components over time. Additionally, I measured multiple aspects of job demands, job control and social support. Prior researchers have suggested that inconsistencies among study results may reflect a failure to distinguish between important dimensions of these variables. Although the confirmatory factor analyses yielded a uni-dimensional factor structure for job demands – and thus I did not explore its theoretically expected facets – measuring these facets is still a strength, and I suggest that future research should continue to measure and test for potentially important components of job demands. Naturally, if future research confirms that job demands belong within a unitary factor, then the theoretically expected facets may be empirically weak. Another strength is that I examined both social support and self-efficacy simultaneously.

Two other strengths – a focus on technical workers and the collectivist culture of Malaysia – are also weaknesses in that my results may not generalise to other types of workers, even in other Eastern countries (which might be collectivist). Thus, the generalisability of the findings should be strengthened by replications of the study in different contexts. The demographics of my sample (e.g., 84 % male and average age of 45 years) also introduce concerns that my sample may be selective. That is, there could be a gender and age bias. Although there are undisputed benefits in using a homogeneous sample, the results of this study might not be generalisable to female-dominated fields of working life. That my sample of technical workers contains a high percentage of male employees seems unsurprising, but it does not preclude the possibility that the sample is biased.

Another limitation of my study is that all the data were obtained solely by self-reports. This means that common method variance could distort the associations among the study variables (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003);

however, others argue that this problem is overstated (e.g., Spector, 2006). Spector (2006) argued that many times common method bias seems to be more of an “urban legend”. On the positive side, my study was based on a longitudinal design, which diminishes the risks for common method variance (Doty & Glick, 1998). Nevertheless, research including more ‘objective’ measures of job design and/or outcomes is still needed.

The next limitation involves the manner in which model modifications were conducted in the CFA analyses. Concerns regarding this process involve whether such modified models generalise to other sample or to the population. This concern is related to the issue of capitalisation on chance (MacCallum, Roznowski, & Necowitz, 1992). Model modifications are based on results obtained from analysis of sample data, and modified models are evaluated by refitting them to the same data (MacCallum, et al., 1992). Thus, specific modifications may well be determined in part by chance characteristics of the observed sample, implying that the modified model might not generalise beyond the sample at hand (MacCallum, 1995). Further research is required to evaluate the modified models using new data.

The specification of the time lag at which predictor and outcome variables influences each other is a potentially important limitation. The time lag between measurement points was arbitrarily specified at six months. Existing literature does not provide guidance about the appropriate time lag for the effects of variables on one another (Sanchez & Viswesvaran, 2002). Although theories in organisational behaviour specify relationships among constructs in causal terms, the time lag between causes and effects and differences in rates of change are often left unspecified (George & Jones, 2000). In the present research I considered a six-month lag time adequate to enable clear identification of the causal relationships between the variables. It is possible that a shorter or longer time period between the onset of predictors and the appearance of effects might produce different results. Therefore, it is recommended that future research test the effect of time on the relationships between the variables based on the conceptualisations and operationalisations of the variables. For example, future research testing the impact of work design on strain might consider using a lag time of more than six months to see if there is a difference in the results. For the

impact of strain on work attitudes, and work attitudes on job performance, one might consider using a shorter time period such as three months.

The next limitation is that my study only tested one-way causal relationships in the longitudinal analyses, but did not test potential reversed and reciprocal cross-lagged effects. It is possible to examine the cross-lagged association to test the reverse effects of the variables, although this was not the aim of the current research. However, most previous studies have typically shown that the reverse effects are weaker than the unidirectional causal associations (e.g. De Lange, Taris, Kompier, Houtman, & Bongers, 2004; Hakanen, et al., 2008). Nonetheless, further research that tests the cross-lagged effects is still needed.

Furthermore, I tested my longitudinal mediated process model at only two time points. Although it is possible to examine the association in a full panel design (Cole & Maxwell, 2003) a comprehensive testing of the study model require at least three waves (Taris & Kompier, 2006). However, the two waves enabled the use of a full panel design as suggested by Zapf and colleagues (1996) and is thus an improvement on cross-sectional design.

Recommendations for Future Research

Several recommendations are made regarding ways in which future research can build based on the current findings. First is concern over the need for longitudinal studies, as emphasised by several experts (Beehr & Newman, 1978). In the current research, some effects were found to be unstable over time. For example, job control (i.e., timing control and skill discretion) was related to anxiety/depression at Time 1, but not at Time 2. Supervisor support was related to social dysfunction at Time 2, but not at Time 1. This lack of stability in the results is not easily explained. Another round of data would be helpful to further test the stability of the results. If results stay stable then we can generalise them, but if they are not stable it will be very hard to make any definite statements about the importance of certain job designs for worker psychological strain. There seems to be a need for theories or models that more directly incorporate the time dimension, that is, dynamic models of job design and psychological strain. Different time models

could be tested with longitudinal data. Further research is recommended to examine these time-based models.

Second, future studies would benefit from use of both objective and subjective measures of work design so that we can examine the process by which work design is perceived and evaluated. Future research could attempt to obtain measures of work design variables from other sources, such as co-workers or superiors. It would also be worthwhile to measure ‘objective’ work design and assess the relationship between perceived and objective work design to see if they are highly correlated or not. The link between ‘objective’ work design and perceptions of work design may be a key element in the process through which psychological strain is affected, and studies that assess both the objective environment and perceptions of it are needed.

Third, although the confirmatory factor analyses yielded a uni-dimensional factor structures for job demands – and thus I did not explore specific facets of job demands – distinguishing between job demands on different levels seems a potentially fruitful avenue for future research. Using demands that are specific to a given profession, and/or to specific outcomes will enable us to disentangle, more specifically, the antecedents of the stressful nature of all kinds of jobs rather than using more general job demands. When designing a study, researchers should consider very carefully which specific job demands should be assessed.

Fourth, future research should also consider expanding the range of work characteristics. One additional work characteristic worthy of further investigation is physical context. Oldham (1996) argued that physical context has been overlooked as an important job feature. One of the few studies of this kind, for example, showed that improved design of office conditions enhanced job satisfaction and productivity of employees (Dressel & Francis, 1987). Grant and Parker (2009) also emphasised that there are two new perspectives of work characteristics – the relational perspective and the proactive perspective. The relational perspective concerns the role of interpersonal interactions and interdependencies at work, whereas the proactive perspective focuses on how employees take initiative to shape their own job designs and work context, as well as how these job designs and work contexts can be structured to facilitate

initiative. Earley and Gibson (1998) also noted that task interdependence is important for collectivists. These perspectives clearly deserve more attention in future research.

Fifth, future research should also attempt to replicate this study among other groups of employees (e.g. managerial, professional). For example, the issue of job demands and job control may vary in salience for different classes of employees, and across industries. Future research also can include cultural aspects to confirm the results of this study. For example, my study did not assess an individualistic versus collectivist cultural orientation directly but rather used country as a proxy for that variable. In future research it would be very useful to attempt to replicate the findings from this study by assessing individualism-collectivism directly and other specific dimension of the culture, such as the cultural dimensions in GLOBE (Global Leadership and Organisational Behaviour Effectiveness) study showing that Malaysia has a high human orientation culture (Javidan, Dorfman, de Luque, & House, 2006).

The next recommendation is that while I have included an important individual difference variable (i.e. self-efficacy), there is evidence that other individual personality variables matter, such as negative affect (Sargent & Terry, 2000) and locus of control (Rodriguez, Bravo, & Schaufeli, 2001). Interestingly, self-efficacy and these other individual differences are theorized to load on a higher-order factor called *core self-evaluations* (Judge, Erez, Bono, & Thoresen, 2002), and future research might consider using this more comprehensive construct as a measure of individual differences. Future research should also aim to examine the role of collective efficacy in work design research. Future research is needed to provide insight into why efficacy beliefs impact stress-related variables. As has been suggested, self-efficacy may impact stress through the success of coping efforts and collective efficacy may serve to enhance social support.

Lastly, although the results of this study supported some of the hypotheses presented, especially the direct effects and mediation hypotheses, by relying solely on questionnaires the opportunity for the respondents to give feedback was limited. The use of interview data to supplement the quantitative measures in future studies could provide a more in-depth picture of this phenomenon. The

interview can be used to seek information relating to the employees' experience of work design in the organisation.

Conclusion

Investigating how work design affects changes in employee work reactions is crucial to better understanding employee well-being and performance in organisations. In the research reported here, I tested the direct effects of work design, social support and self-efficacy on psychological strain in a collectivist with high power distance Malaysian culture. I also investigated the moderating effects of job control, social support and self-efficacy. Moreover, I examined the mediation effects of psychological strain in the relationships between work design variables and work attitudes. I also investigated the mediation effects of work attitudes, including job satisfaction, affective commitments and turnover intentions, in the relationship between psychological strain and job performance.

Generally, the cross-sectional analyses provide more support for the hypothesised relationships than the longitudinal analyses do. This study showed that work design, psychological strain, and its outcomes are interrelated, which means work design related to psychological strain, which in turn was linked to job satisfaction, affective commitment, turnover intentions and job performance. Furthermore, the current study showed that job satisfaction, affective commitment and turnover intentions were associated with job performance in cross-sectional analyses (although not in the longitudinal analyses).

The JDC model was not fully replicated in the Malaysian context. Job control variables (i.e. methods control and decision authority) had a reverse buffering effect in the relationship between job demands and psychological strain. My research also provides some support for the main effects but little support for the moderating effects of social support on psychological strain, highlighting their importance to our understanding of work design. The current research, however, provides a little support for the JDCS model in Malaysia, particularly in the cross-sectional analyses. Self-efficacy was also found to be important in the relationships between job demands and psychological strain. High self-efficacy reduces psychological strain, whereas low self-efficacy increases psychological

strain. Self-efficacy as a personal resource seemed to buffer the negative effects of stressful job demands on psychological strain.

The present research also emphasises the important role of anxiety/depression and social dysfunction as mediators in work design research. I found evidence that anxiety/depression and social dysfunction are mechanisms in the short-term relationships between work design and work attitude outcomes. Additionally, my research also provides evidence that job satisfaction, affective commitment and turnover intentions function as mediators in the relationships between psychological strain and job performance. These findings came predominantly from the cross-sectional analyses, as the longitudinal analyses failed to provide support for the mediation effects of job satisfaction, affective commitment and turnover intentions.

To conclude, this research adds new knowledge in relation to the impact of work design on employee well-being and performance in the Malaysian setting. The findings will aid both practitioners and managers to take action to reduce psychological strain by re-designing jobs, reducing strain by augmenting employee support programmes, and intervening in the process to enhance job performance by managing work attitudes. It is also important to take self-efficacy into consideration when devising interventions to prevent and manage job strain. Human capital is an important asset to organisations, and organisations should strive to provide healthier work environments in order to reduce the negative effects of psychological strain and enhance worker productivity.

REFERENCES

- Abdel-Halim, A. A. (1981). A reexamination of ability as a moderator of role perception-satisfaction relationship. *Personnel Psychology, 34*, 549-561.
- Abdullah, A. (2001). Influence of ethnic values at the Malaysian workplace. In A. Abdullah & A. Low (Eds.), *Understanding the Malaysian workforce: Guidelines for managers* (pp. 1-24). Kuala Lumpur: Malaysian Institute of Management.
- Abdullah, A. (2005). *Going glocal: Cultural dimensions in Malaysian management*. Kuala Lumpur: Malaysian Institute of Management.
- Ackfelt, A. L., & Coote, L. V. (2005). A study of organizational citizenship behaviors in retail setting. *Journal of Business Research, 58*, 151-159.
- Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 267-299). New York: Academic Press.
- Ahmad, Z. A., & Aafaqi, R. (2004). Organisational leadership in the Malaysian context. In D. Tjosvold & K. Leung (Eds.), *Leading in high growth Asia: Managing relationship for teamwork and change* (pp. 109-133). Hong Kong: World Scientific Publishing.
- Ahmed, T., Mouratidis, H., & Preston, D. (2009). Website design guidelines: High power distance and high-context culture. *International Journal of Cyber Society and Education, 2*(1), 47-60.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.
- Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology, 63*, 1-18.
- Aronsson, G., & Rissler, A. (1998). Psychophysiological stress reactions in female and male urban bus drivers. *Journal of Occupational Health Psychology, 3*, 122-129.

- Baker, E., Israel, B., & Schurman, S. (1996). Role of control and support in occupational stress: An integrated model. *Social Science & Medicine*, 43, 1145-1159.
- Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: state of the art. *Journal of Managerial Psychology*, 22(3), 309-328.
- Bakker, A. B., Demerouti, E., de Boer, E., & Schaufeli, W. B. (2003). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior*, 62, 341-356.
- Bakker, A. B., Demerouti, E., Taris, T. W., & Schaufeli, W. B. (2003). A multigroup analysis of the job demands-resources model in four home care organization. *International Journal of Stress Management*, 10, 16-38.
- Bandura, A. (1977). Self-efficacy: Toward a unified theory of behavioral change. *Psychological review*, 84, 191-215.
- Bandura, A. (1986). *The social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44(9), 1175-1184.
- Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 1-45). Cambridge, UK: Cambridge University Press.
- Bandura, A. (1996). *A socio-cognitive view on shaping the future*. Paper presented at the Proceedings of the Korean Psychological Association 50th Anniversary Conference, Seoul, Korea.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.
- Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88(1), 87-99.
- Banks, M. H., Clegg, C. W., Jackson, P. R., Kemp, N. J., Stafford, E., & Wall, T. (1980). The use of the General Health Questionnaire as an indicator of mental health in occupational studies. *Journal of Occupational Psychology*, 53, 187-194.

- Banks, M. H., & Jackson, P. R. (1982). Unemployment and risk of minor psychiatric disorder in young people: cross-sectional and longitudinal evidence. *Psychological Medicine*, *12*, 789-798.
- Barley, S. R. (1996). Technician in the workplace: Ethnographic evidence for bringing work into organization studies. *Administrative Science Quarterly*, *41*(404-441).
- Barley, S. R., & Kunda, G. (2001). Bringing work back in. [Article]. *Organization Science*, *12*(1), 76-95.
- Barnard, J. (1997). The workplace environment: What do technical workers want? *Industrial Management*, *September/October*, 14-16.
- 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.
- Baron, R., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Bateman, T. S., & Organ, D. W. (1983). Job satisfaction and the good soldier: The relationship between affect and employee citizenship. *Academy of Management Journal*, *26*, 587-595.
- Beehr, T. (1995). *Psychological stress in the workplace*. London, UK: Routledge.
- Beehr, T. A. (1995). *Psychological stress in the workplace*. New York: Routledge.
- 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.
- Beehr, T. A., Jex, S. M., Stacy, B. A., & Murray, M. A. (2000). Work stressors and coworker support as predictors of individual strain and job performance. *Journal of Organizational Behavior*, *21*, 391-405.
- Beehr, T. A., & Newman, J. E. (1978). Job stress, employee health, and organizational effectiveness: A facet analysis, model, and literature review. *Personnel Psychology*, *31*, 665-699.
- Beit-Hallahmi, B., & Argyle, M. (1997). *The psychology of religious behavior, belief and experience*. London: Routledge.

- Bergh, D. D., & Fairbank, J. F. (2002). Measuring and testing change in strategic management research. *Strategic Management Journal*, *23*, 359-366.
- Bergman, M. E. (2006). The relationship between affective and normative commitment: Review and research agenda. *Journal of Organizational Behavior*, *27*, 645-663.
- Bhagat, R. S., & Allie, S. M. (1989). Organizational stress, personal life stress, symptoms of life strain: An examination of the role of sense of competence. *Journal of Vocational Behavior*, *35*, 231-253.
- Bishop, G. D., Enkelmann, H. C., Tong, E. M. W., Why, Y. P., Diong, S. M., Ang, J., et al. (2003). Job demands, decisional control, and cardiovascular responses. *Journal of Occupational Health Psychology*, *8*(2), 146-156.
- Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley.
- Bollen, K. A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology*, *20*, 115-140.
- Bolon, D. S. (1997). Organizational citizenship behavior among hospital employees: A multidimensional analysis involving job satisfaction and organizational commitment. *Hospital & Health Service Administration*, *42*(2), 221-241.
- Bond, J. T., Galinsky, E., & Swanberg, J. E. (1997). *The 1997 national study of the changing workforce*. New York: Families and Work Institute.
- Boomsma, A. (1983). *On the robustness of LISRELL against small sample size and nonnormality*. Amsterdam: Sociometric Research Foundation.
- Boonzaier, B., Ficker, B., & Rust, B. (2001). A review of research on the Job Characteristics Model and the attendant job diagnostic survey. *Manage*, *32*(1), 11-34.
- Borman, W. C., & Motowidlo, S. J. (1997). Task performance and contextual performance: The meaning for personnel selection research. [Article]. *Human Performance*, *10*(2), 99.
- Brannick, M. T. (1995). Critical comments on applying covariance structure modelling. *Journal of Organizational Behavior*, *16*, 201-213.
- Brannon, L., & Feist, J. (1992). *Health psychology*. Belmont, CA: Wadsworth.
- Brough, P., & Frame, R. (2004). Predicting police job satisfaction and turnover intentions: The role of social support and police organisational variables. *New Zealand Journal of Psychology*, *33*(1), 8-16.

- Brough, P., O'Driscoll, M. P., Kalliath, T., Cooper, C. L., & Poelmans, S. A. Y. (2009). *Workplace psychological health*. Cheltenham, UK: Edward Elgar Publishing, Inc.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- BureauofLaborStatistics. (2009). Occupational outlook Handbook, 2008-09 edition. Retrieved December, 16, 2009, from <http://www.bls.gov/oco/oco2003.htm>
- Burke, M. J., Borcki, C. C., & Hurley, A. E. (1992). Reconceptualizing psychological climate in a retail service environment: A multiple-stakeholder perspective. *Journal of Applied Psychology, 77*, 717-729.
- Bycio, A. F., Hackett, R. D., & Allen, N. J. (1995). Further assessments of Bass's (1985) conceptualizations of transactional and transformational leadership. *Journal of Applied Psychology, 80*, 468-478.
- Byrne, B. M. (2001). *Structural Equation Modeling with AMOS: Basic concepts, application, and programming*. Mahwah, NJ: Erlbaum.
- Carayon, P. (1993). A longitudinal test of Karasek's job strain model among office workers. *Work and Stress, 7*, 299-314.
- Carayon, P., & Zijlstra, F. (1999). Relationship between job control, work pressure and strain: Studies in the USA and in The Netherlands. *Work & Stress, 13*(1), 32-48.
- Carmeli, A., & Schaubroeck, J. (2005). How leveraging human resource capital with its competitive distinctiveness enhances the performance of commercial and public organizations. *Human Resource Management, 44*(4), 391-412.
- Carmeli, A., & Weisberg, J. (2006). Exploring turnover intentions among three professional groups of employees. *Human Resource Development International, 9*(2), 191-206.
- Chambel, M. J., & Cural, L. (2005). Stress in academic life: Work characteristics as predictors of students well-being and performance. *Applied Psychology: An International Review, 54*(1), 135-147.

- Champoux, J. E., & Peters, W. S. (1987). Form, effect size, and power in moderated regression analysis. *Journal of Occupational Psychology*, 60(243-255).
- Chan, D. (1998). The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal mean and covariance structures analysis (LMACS) and multiple indicator latent growth modeling (MLGM). *Organizational Research Methods*, 1, 421-483.
- Chay, Y. W. (1993). Social support, individual differences and well-being: A study of small business entrepreneurs and employees. *Journal of Occupational and Organizational Psychology*, 66, 285-302.
- Cheung, G. W., & Lau, R. S. (2008). Testing mediation and suppression effects of latent variables: Bootstrapping with structural equation models. *Organizational Research Methods*, 11(2), 296-325.
- Chwalisz, K., Altmaier, E. M., & Russell, D. W. (1992). Causal attributions, self-efficacy cognitions, and coping with stress. *Journal of Social and Clinical Psychology*, 11, 377-400.
- Cohen, A. (2003). *Multiple commitments in the workplace: An integrative approach*. Mahwah, NJ: Erlbaum.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychology*, 7, 269-297.
- Cohen, S., & Wills, T. A. (1985). Stress, social support and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and Tips in the use of structural equation modeling. *Journal of Abnormal Psychology*, 112(4), 558-577.
- Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research and application*. Thousand Oaks, CA: Sage.
- Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2003). Employee assistance program. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 289-304). Washington, DC: American Psychological Association.

- Cotton, J., & Tuttle, J. (1986). Employee turnover: A meta-analysis and review with implications for research. *Academy of Management Review*, *11*, 55-70.
- Cropanzano, R., Kacmar, K. M., & Bozeman, D. P. (1995). Organizational politics, justice, and support: Their differences and similarities. In R. Cropanzano & K. M. Kacmar (Eds.), *Organizational politics, justice, and support: Managing the social climate of the workplace* (pp. 2-18). Westport, CT: Quorum Books.
- Cropanzano, R., Rupp, D. E., & Byrne, Z. S. (2003). The relationship of emotional exhaustion to work attitudes, job performance, and organizational citizenship behaviors. *Journal of Applied Psychology*, *88*(1), 160-169.
- Cropanzano, R., Rupp, D. E., Mohler, C. J., & Schminke, M. (2001). Three roads to organizational justice. In J. Ferris (Ed.), *Research in personnel and human resources management* (Vol. 20, pp. 1-113). Greenwich, CT: JAI Press.
- Cummings, B. (2001). Sales ruined my personal life. *Sales and Marketing Management*, *153*, 44-51.
- Daniels, K. (1999). Coping and the job demands-control-support model: An exploratory study. *International Journal of Stress Management*, *6*(2), 125-144.
- Daniels, K. (2006). Rethinking job characteristics in work stress research. *Human Relations*, *59*(3), 267-290.
- Daniels, K., Beesley, N., Cheyne, A., & Wimalasiri, V. (2008). Coping processes linking the demands-control-support model, affect and risky decisions at work. *Human Relations*, *61*(6), 845-874.
- Danna, K. (1999). Health and well-being in the workplace: A review and synthesis of the literature. *Journal of Management*, *25*, 357-384.
- Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: Development and application of a slope different test. *Journal of Applied Psychology*, *91*, 917-926.
- De Croon, E. M., Sluiter, J. K., & Blonk, R. W. B. (2004). Stressful work, psychological strain, and turnover: A 2-year prospective cohort study of truck drivers. *Journal of Applied Psychology*, *89*(3), 442-454.

- De Jonge, J., Dormann, C., Janssen, P. P. M., Dollard, M. F., Landeweerd, J. A., & Nijhuis, J. N. (2001). Testing reciprocal relationships between job characteristics and psychological well-being: A cross-lagged structural equation model. *Journal of Occupational and Organizational Psychology*, *74*, 29-46.
- De Jonge, J., Janssen, P. P. M., & van Breukelen, G. J. P. (1996). Testing the Demand-Control-Support model among health-care professionals: A structural equation model. *Work and Stress*, *10*, 209-224.
- De Jonge, J., & Schaufeli, W. B. (1998). Job characteristics and employee well-being: A test of Warr's vitamin model in health care workers using structural equation modelling. *Journal of Organizational Behavior*, *19*, 387-407.
- De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2003). The very best of the millenium: Longitudinal research on the job demands-control-(support) model. *Journal of Occupational Health Psychology*, *8*, 282-305.
- De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress*, *18*(2), 149-166.
- De Rijk, A. E., Le Blanc, P. M., Schaufeli, W. B., & De Jonge, J. (1998). Active coping and need for control as moderators of the job demand-control model: Effects on burnout. *Journal of Occupational and Organizational Psychology*, *86*, 499-512.
- DeFrank, R. S., & Ivancevich, J. M. (1998). Stress on the job: An executive update. *Academy of Management Executive*, *12*, 55-66.
- Delery, J. E., & Shaw, J. D. (2001). The strategic management of people in work organizations: Review, synthesis, and extension. *Research in Personnel and Human Resources Management*, *20*, 165-197.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*, 499-512.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailord design method* (2nd ed.). New York: John Wiley.

- Dollard, M. F., Winefield, H. R., Winefield, A. H., & De Jonge, J. (2000). Psychosocial job strain and productivity in human resource service workers: A test of the demand-control-support model. *Journal of Occupational and Organizational Psychology*, 73, 501-510.
- Doty, D., & Glick, W. H. (1998). Common methods bias: Does common methods variance really bias results? *Organizational Research Methods*, 1, 374-406.
- Dressel, P. L., & Francis, J. (1987). Office productivity: contribution of the work station. *Behaviour and Information Technology*, 6, 279-284.
- Dwyer, D. J., & Ganster, D. C. (1991). The effects of job demands and control on employee attendance and satisfaction. *Journal of Organizational Behavior*, 12, 595-608.
- Earley, P. C. (1994). Self or Group? Cultural Effects of Training on Self-efficacy and Performance. [Article]. *Administrative Science Quarterly*, 39(1), 89-117.
- Earley, P. C., & Gibson, C. B. (1998). Taking Stock in Our Progress on Individualism-Collectivism: 100 Years of Solidarity and Community. [Article]. *Journal of Management*, 24(3), 265-304.
- Edwards, J. R., Scully, J. A., & Brtek, M. D. (2000). The nature and outcomes of work: A replication and extension of interdisciplinary work design research. *Journal of Applied Psychology*, 85(6), 860-868.
- Eisenberger, R., Cummings, J., Armeli, S., & Lynch, P. (1997). Perceived organizational support, discretionary treatment, and job satisfaction. *Journal of Applied Psychology*, 82, 812-820.
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(500-507).
- Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, L. I., & Rhoades, L. (2002). Perceived supervisor support: Contribution to perceived organizational support and employee retention. *Journal of Applied Psychology*, 87, 565-573.
- European Foundation. (2000). *Time constraints and autonomy at work in the European Union*. Dublin: European Foundation for the Improvement of Living and Working Conditions.

- European Foundation. (2001). *Ten years of working conditions in the European Union*. Dublin, Ireland: European Foundation for the Improvement of Living and Working Conditions.
- Evans, M. G. (1985). A monte carlo study of the effects of correlated method variance in moderated multiple regression analysis. *Organizational Behavior and Human Decision Processes*, 36, 305-323.
- Finkel, S. E. (1995). *Causal analysis with panel data*. Thousand Oaks: Sage Publications.
- Fishbein, M., & Ajzen, I. (1974). Attitudes towards objects as predictors of single and multiple behavioral criteria. *Psychological review*, 81, 29-74.
- Fletcher, B. C., & 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.
- Fox, M. L., Dwyer, D. J., & Ganster, D. C. (1993). Effects of stressful job demands and control on psychological and attitudinal outcomes in hospital setting. *Academy of Management Journal*, 36, 289-318.
- Francis, L., & Barling, J. (2005). Organizational injustice and psychological strain. *Canadian Journal of Behavioural Science*, 37(4), 250-261.
- French, D. J., & Tait, R. J. (2004). Measurement invariance in the General Health Questionnaire-12 in young Australian adolescents. *European Child & Adolescent Psychiatry*, 13, 1-7.
- French, J., Caplan, R., & Harrison, V. (1982). *The mechanisms of job stress and strain*. Chichester, England: Wiley.
- Frese, M. (1989). Theoretical models of control and health. In C. Cooper & J. J. Hurrell (Eds.), *Causes, Coping and Consequences of Stress at Work* (pp. 375-411). Chichester: John Wiley & Sons.
- Frese, M. (1999). Social support as a moderator of the relationship between work stressors and psychological dysfunctioning: A longitudinal study with objective measures. *Journal of Occupational Health Psychology*, 4(3), 179-192.
- Frese, M., & Zapf, D. (1988). Methodological issues in the study of work stress: Objective vs subjective measurement of work stress and the question of longitudinal studies. In C. L. Cooper & R. Payne (Eds.), *Causes, coping and consequences of stress at work*. Great Britain: John Wiley & Sons Ltd.

- Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In H. C. Triandis, M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organisational psychology* (2nd ed., pp. 271-340). Palo Alto, CA: Consulting Psychologist Press.
- Fried, Y., & Ferris, G. R. (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology, 40*, 287-322.
- Fried, Y., Grant, A. M., Levi, A. S., Hadani, M., & Slowik, L. H. (2007). Job design in temporal context: A career dynamics perspective. *Journal of Organizational Behavior, 28*, 911-927.
- Fried, Y., Shirom, A., Gilboa, S., & Cooper, C. L. (2008). The mediating effects of job satisfaction and propensity to leave on role stress - job performance relationships: Combining meta-analysis and structural equation modeling. *International Journal of Stress Management, 15*(4), 305-328.
- Ganster, D. C., & Fusilier, M. R. (1989). Control in the workplace. In C. Cooper & I. T. Robertson (Eds.), *International review of industrial and organisational psychology* (Vol. 4, pp. 235-280). Chichester, UK: Wiley.
- Ganster, D. C., & Schaubroeck, J. (1991). Role stress and worker health: An extension of the plasticity of self-esteem. *Journal of Social Behavior and Personality, 6*, 349-360.
- Gardell, B. (1982). Worker participation and autonomy: A multilevel approach to democracy at the workplace. *International Journal of Health Services, 4*, 527-558.
- Gelsema, T. I., van der Doef, M., Maes, S., Akerboom, S., & Verhoeven, C. (2005). Job stress in the nursing profession: The influence of organizational and environmental conditions and job characteristics. *International Journal of Stress Management, 12*(3), 222-240.
- George, J. M., & Jones, G. R. (1996). The experience of work and turnover intentions: Interactive effects of value attainment, job satisfaction, and positive mood. *Journal of Applied Psychology, 81*, 318-325.
- George, J. M., & Jones, G. R. (2000). The role of time in theory and theory building. *Journal of Management, 26*, 657-684.
- Gersick, C. J. G., Dutton, J. E., & Bartunek, J. M. (2000). Learning from academia: The importance of relationships in professional life. [Article]. *Academy of Management Journal, 43*(6), 1026-1044.

- Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, *17*, 183-211.
- Goerge, J. M., Reed, T. F., Ballard, K. A., Colin, J., & Fielding, J. (1993). Contact with AIDS patients as a source of work-related distress: Effects of organizational social support. *Academy of Management Journal*, *36*, 157-171.
- Goldberg, D., & Williams, P. (1988). *GHQ: A user's guide to the General Health Questionnaire*. Windsor: NFER/Nelson, Windsor.
- Gollob, H. F., & Reichardt, C. S. (1991). Interpreting and estimating indirect effects assuming time lags really matter. In L. M. Collin & J. L. Horn (Eds.), *Best methods for the analysis of change: Recent advances, unanswered questions, future directions* (pp. 243-259). Washington, DC: American Psychological Association.
- Graetz, B. (1991). Multidimensional properties of the General Health Questionnaire. *Social Psychiatry and Psychiatric Epidemiology*, *26*, 132-138.
- Grant, A. M., & Parker, S. K. (2009). Redesigning work design theories: The rise of relational and proactive perspectives. *The Academy of Management Annals*, *3*(1), 317-375.
- Greeno, E. J., Hughes, A. K., Hayward, R. A., & Parker, K. L. (2007). A confirmatory factor analysis of the professional opinion scale. *Research on Social Work Practice*, *17*(4), 482-493.
- Griffeth, R. W., Hom, P. W., & Gaertner, S. (2000). A Meta-analysis of antecedents and correlates of employee turnover: Update, moderator tests, and research implications for the next millennium. [Article]. *Journal of Management*, *26*(3), 463-488.
- Hackman, J. R., & Lawler, E. E. (1971). Employee reaction to job characteristics. *Journal of Applied Psychology*, *55*, 259-286.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organization Behavior and Human Performance*, *16*, 250-279.
- Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.

- Hakanen, J. J., Schaufeli, W. B., & Ahola, K. (2008). The Job Demands-Resources model: A three-year cross-lagged study of burnout, depression, commitment, and work engagement. [Article]. *Work & Stress*, 22(3), 224-241.
- Halbesleben, J. R. B., & Buckley, M. R. (2004). Burnout in Organizational Life. *Journal of Management*, 30(6), 859-879.
- Harris, K. J., James, M., & Boonthanom, R. (2005). Perceptions of organizational politics and cooperation as moderators of the relationship between job strains and intent to turnover. *Journal of Managerial Issues*, XVII(1), 26-42.
- Heaney, C. A., Price, R. H., & Rafferty, J. (1995). Increasing coping resources at work: A field experiment to increase social support, improve work team functioning, and enhance employee mental health. *Journal of Organizational Behavior*, 16, 335-352.
- Hobfoll, S. E. (2001). The influence of culture, community, and the nested-self in the stress process: Advancing conservation of resources theory. *Applied Psychology: An International Review*, 50, 337-370.
- Hofstede, G. H. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, Calif.: Sage Publication.
- Hofstede, G. H. (1985). The interaction between national and organizational value systems. *Journal of Management Studies*, 22, 347-357.
- Hofstede, G. H. (1991). *Culture and organization: Software of the mind*. London: McGraw-Hill.
- Hofstede, G. H. (1991). Management in multicultural society. *Malaysian Management Review*, 26, 3-12.
- Holman, D. J., & Wall, T. D. (2002). Work characteristics, learning-related outcomes, and strain: A test of competing direct effects, mediated, and moderated models. *Journal of Occupational Health Psychology*, 7(4), 283-301.
- Hom, P. W., & Griffeth, R. W. (1995). *Employee turnover*. Cincinnati, OH: Southwestern.
- Homans, G. (1961). *Social behavior*. New York: Harcourt, Brace & World.
- House, J. S. (1981). *Work stress and and social support*. Reading, MA: Addison Wesley.

- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Hui, C. H. (1982). Locus of control: A review of cross-cultural research. *International Journal of Intercultural Relations, 6*, 301-323.
- Hui, C. H., & Triandis, H. C. (1986). Individualism and collectivism: A study of cross-cultural researchers. *Journal of Cross-Cultural Psychology, 17*, 225-248.
- Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology, 92*(5), 1332-1356.
- Hurrell, J. J., & McLaney, M. A. (1989). Control, job demands and job satisfaction. In S. L. Sauter, J. J. Hurrell & C. Cooper (Eds.), *Job control and Worker Health* (pp. 97-103). New York: John Wiley & Sons.
- Iaffaldano, M. T., & Muchinsky, P. M. (1985). Job satisfaction and job performance: A meta-analysis. *Psychological Bulletin, 97*, 251-273.
- Ilies, R., & Judge, T. A. (2002). Understanding the dynamic relationships among personality, mood, and job satisfaction: A field experience-sampling study. *Organizational Behavior and Human Decision Processes, 89*, 1119-1139.
- Irvine, D. M., & Evans, M. G. (1995). Job satisfaction and turnover among nurses: Integrating research findings across studies. *Nursing Research, 44*, 246-253.
- Ito, J. K., & Brotheridge, C. M. (2003). Resources, coping strategies, and emotional exhaustion: A conservation of resource perspective. *Journal of Vocational Behavior, 63*(3), 490-509.
- Jaccard, J., Turrisi, R., & Wan, C. K. (1990). *Interaction effects in multiple regression*. Newbury Park, CA: Sage.
- Jackson, P. R., Wall, T. D., Martin, R., & Davids, K. (1993). New measures of job control, cognitive demand, and production responsibility. *Journal of Applied Psychology, 78*, 753-762.

- Jain, A. K., & Sinha, A. K. (2005). General health in organizations: Relative relevance of emotional intelligence, trust, and organizational support. *International Journal of Stress Management, 12*(3), 275-273.
- James, L. R., & Brett, J. M. (1984). Mediators, moderators, and tests for mediation. *Journal of Applied Psychology, 69*(2), 307-321.
- James, L. R., Mulaik, S. A., & Brett, J. M. (2006). A tale of two methods. *Organizational Research Methods, 9*(2), 233-244.
- Janssen, P. P. M., De Jonge, J., & Bakker, A. B. (1999). Specific determinants of intrinsic work motivation, burnout and turnover intentions: A study among nurses. *Journal of Advanced Nursing, 29*, 1360-1369.
- Javidan, M., Dorfman, P. W., de Luque, M. S., & House, R. J. (2006). In the eye of the beholder: Cross cultural lessons in leadership from project GLOBE. *Academy of Management Perspectives, February*, 67-90.
- Jex, S. M. (1998). *Stress and job performance: Theory, research, and implications for managerial practice*. Thousand Oaks, CA: Sage.
- Jex, S. M., & Beehr, T. (1991). Emerging theoretical and methodological issues in the study of work-related stress. In G. R. Ferris & K. M. Rowland (Eds.), *Research in Personnel and Human Research Management* (Vol. 9, pp. 311-364). Greenwich, CT: JAI Press.
- Jex, S. M., & Bliese, P. D. (1999). Efficacy beliefs as a moderator of the impact of work-related stressors: A multilevel study. *Journal of Applied Psychology, 84*(3), 349-361.
- Jex, S. M., Bliese, P. D., Buzzell, S., & Primeau, J. (2001). The impact of self-efficacy on stressor-strain relations: Coping style as an explanatory mechanism. *Journal of Applied Psychology, 86*(3), 401-409.
- Jex, S. M., & Gudanowski, D. M. (1992). Efficacy beliefs and work stress: An exploratory study. *Journal of Organizational Behavior, 13*, 509-517.
- Johns, G., Xie, J. L., & Fang, Y. (1992). Mediating and moderating effects in job design. *Journal of Management, 18*(4), 657-676.
- Johnson, J. V. (1986). *The impact of workplace social support, job demands, and work control upon cardiovascular disease in Sweden*. Stockholm: University of Stockholm.

- Johnson, J. V. (1989). Control, collectivity and the psychosocial work environment. In S. L. Sauter, J. J. Hurrell & C. L. Cooper (Eds.), *Job control and worker health* (pp. 55-74). Chichester: John Wiley.
- Johnson, J. V., & Hall, E. M. (1988). Job strain, workplace social support, and cardiovascular disease: A cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health*, 78, 1336-1342.
- Jones, F., & Fletcher, B. C. (1996). Job control and health. In M. Schabracq, J. A. M. Winnubst & C. L. Cooper (Eds.), *Handbook of work and health psychology* (pp. 55-74). Chichester, England: John Wiley.
- Jonsson, J. O. (1998). Class and the changing nature of work: Testing hypotheses of deskilling and convergence among Swedish employees. *Work Employment Society*, 12(4), 603-633.
- Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance. *Journal of Applied Psychology*, 86, 80-92.
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). A measures of self-esteem, neuroticism, locus of control, and generalized of self-efficacy indicators of a common core construct? *Journal of Personality and Social Psychology*, 83(3), 693-710.
- Judge, T. A., & Larsen, R. J. (2001). Dispositional affect and job satisfaction: A review and theoretical extension. *Organizational Behavior and Human Decision Processes*, 86(1), 67-98.
- Judge, T. A., Thoresen, C. J., & Bono, J. E. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, 127, 376-407.
- Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, 127, 376-407.
- Kahn, R. L., & Byosiere, P. (1992). Stress in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 3, pp. 571-650). Palo Alto, CA: Consulting Psychologists Press.

- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *The Academy of Management Journal*, 33(4), 692-724.
- Kakar, S. (1978). Authority patterns and subordinate behavior patterns in Indian organization. *Administrative Science Quarterly*, 16, 298-307.
- Kalliath, T. J., O'Driscoll, M. P., & Brough, P. (2004). A confirmatory factor analysis of the General Health Questionnaire-12. *Stress and Health*, 20, 11-20.
- Karademas, E. C. (2006). Self-efficacy, social support and well-being: The mediating role of optimism. *Personality and Individual Differences*, 40, 1281-1290.
- Karasek, R. A. (1979a). Job demands, job decision latitude, and mental strain: Implication for job redesign. *Administrative Science Quarterly*, 24, 285-308.
- Karasek, R. A. (1979b). Job demands, job decision latitude, and mental strain: Implications for job redesign. [Article]. *Administrative Science Quarterly*, 24(2), 285-308.
- Karasek, R. A. (1985). *Job Content Questionnaire*. Los Angeles: Department of Industrial and Systems Engineering, University of Southern California.
- Karasek, R. A. (1989). Control in the workplace and its health-related aspects. In S. L. Sauter, J. J. Hurrell & C. L. Cooper (Eds.), *Job control and worker health* (pp. 129-159). Chichester: John Wiley & Sons.
- Karasek, R. A. (1997). Demand/control model: A social, emotional, and physiological approach to stress risk and active behavior development *Encyclopedia of Occupational Health and Safety Volume II* (4th ed.). Geneva: International Labor Office.
- Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. New York: Basic Books.
- Karsh, B., Booske, B. C., & Sainfort, F. (2005). Job and organizational determinants of nursing home employee commitment, job satisfaction and intent to turnover. *Ergonomics*, 48(10), 1260-1281.
- Kelloway, E. K. (1998). *Using LISREL for structure equation modeling*. CA: International Educational and Professional Publisher, Sage Publication.

- Kenny, D. A. (1975). Cross-lagged panel correlation: A test for spuriouness. *Psychological Bulletin*, 82, 887-903.
- Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. T. Gilbert, S. T. Fiske & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 1, pp. 233-265). New York: McGraw-Hill.
- Keoske, G. F., Kirk, S. A., & Keoske, R. D. (1993). Coping with job stress: Which strategies work best? *Journal of Occupational and Organizational Psychology*, 66, 319-335.
- Kinicki, A. J., & Latack, J. C. (1990). Exploration of the construct of coping with involuntary job loss. *Journal of Vocational Behavior*, 36, 339-360.
- Kinnunen, U., Feldt, T., & Makikangas, A. (2008). Testing the effort-reward imbalance model among Finish managers: The role of perceived organizational support. *Journal of Occupational Health Psychology*, 13(2), 114-127.
- Kirschenbaum, A., & Weisberg, J. (1994). Job search, intentions and turnover: the mismatched trilogy. *Journal of Vocational Behavior*, 44, 17-31.
- Kivimaki, M., Vahtera, J., Thomson, L., Griffiths, A., Cox, T., & Pentti, J. (1997). Psychosocial factors predicting employee sickness absence during economic decline. *Journal of Applied Psychology*, 82, 858-872.
- Klein, H. J., Fan, J., & Preacher, K. J. (2006). The effects of early socialization experiences on content mastery and outcomes: A mediational approach. *Journal of Vocational Behavior*, 68, 96-115.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford.
- Ko, J.-W., Price, J. L., & Mueller, C. W. (1997). Assessment of Meyer and Allen's three-component model of organizational commitment in South Korea. *Journal of Applied Psychology*, 82, 961-973.
- Koslowsky, M. (1998). *Modeling the stress-strain relationship in work settings*. New York: Routledge.
- Kristensen, T., Bjorner, J. B., Christensen, K. B., & Borg, V. (2004). The distinction between workplace and working hours in the measurement of quantitative demands at work. *Work & Stress*, 18, 305-322.

- Kuijer, R. G., & de Ridder, D. (2003). Discrepancy in illness-related goals and quality of life in chronically ill patients: the role of self-efficacy. *Psychology and Health, 18*, 313-330.
- Kurbanoglu, S. S. (2003). Self-efficacy: a concept closely linked to information literacy and lifelong learning. *Journal of Documentation, 59*(6), 635-646.
- Kushnir, T., & Melamed, S. (1991). Work-Load, Perceived Control and Psychological Distress in Type A/B Industrial Workers. *Journal of Organizational Behavior, 12*(2), 155-168.
- Lam, S. S., Hui, C., & Law, K. S. (1999). Organizational citizenship behavior: Comparing perspectives of supervisors and subordinates across four international samples. *Journal of Applied Psychology, 84*(4), 594-601.
- Landsbergis, P. A. (1988). Occupational Stress Among Health Care Workers: A Test of the Job Demands -- Control Model. *Journal of Organizational Behavior, 9*(3), 217-239 CR - Copyright © 1988 John Wiley & Sons.
- Landsbergis, P. A., Schnall, P. L., Belkic, K. L., Baker, D., Schwartz, M., & Pickering, T. G. (2001). Work stressors and cardiovascular disease. *Work, 17*(3), 191-208.
- Landsbergis, P. A., Schnall, P. L., Deitz, D., Friedman, R., & Pickering, T. (1992). The patterning of psychological attributes and distress by 'job strain' and social support in a sample of working men. *Journal of Behavioral Medicine, 15*, 379-405.
- Lang, J., Thomas, J. L., Bliese, P. D., & Adler, A. B. (2007). Job Demands and Job Performance: The Mediating Effect of Psychological and Physical Strain and the Moderating Effect of Role Clarity. *Journal of Occupational Health Psychology, 12*(2), 116-124.
- Lawler III, E. E., & Porter, L. W. (1967). The Effect of Performance on Job Satisfaction. [Article]. *Industrial Relations, 7*(1), 20-28.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotions. *American Psychologist, 46*, 819-834.

- Lazarus, R. S. (1995). Psychological stress in the workplace. In R. Crandall & P. L. Perrewe (Eds.), *Occupational stress: A handbook* (pp. 3-14). Washington, DC: Taylor & Francis.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.
- Lee, R. T., & Ashforth, B. E. (1996). A meta analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology, 81*, 123-133.
- Lepak, D. P., & Snell, S. A. (1999). The human resource architecture: Toward a theory of human capital allocation and development. *Academy of Management Review, 24*, 31-48.
- LePine, J. A., Podsakoff, N. P., & LePine, M. A. (2005). A meta-analytic test of the challenge stressor-Hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. [Article]. *Academy of Management Journal, 48*(5), 764-775.
- Levy, P. L. (2003). *Industrial/Organizational Psychology: Understanding the workplace*. Boston: Houghton Mifflin Company.
- Lewig, K. A., Xanthopoulou, D., Bakker, A. B., Dollard, M. F., & Metzger, J. C. (2007). Burnout and connectedness among Australian volunteers: A test of the Job Demands-Resources model. [doi: DOI: 10.1016/j.jvb.2007.07.003]. *Journal of Vocational Behavior, 71*(3), 429-445.
- Lim, L. (2001). Work-related values of Malays and Chinese Malaysians. *International Journal of Cross Cultural Management, 1*(2), 209-226.
- Litt, M. D. (1988). Cognitive mediators of stressful experience: Self-efficacy and perceived control. *Cognitive Therapy and Research, 54*, 149-160.
- Liu, C., & Spector, P. E. (2005). International and cross cultural issues. In J. Barling, E. K. Kelloway & M. R. Frone (Eds.), *Handbook of work stress* (pp. 487-515). Thousand Oaks: Sage Publication, Inc.
- Liu, C., Spector, P. E., & Jex, S. M. (2005). The relation of job control with job strains: A comparison of multiple data sources. *Journal of Occupational and Organizational Psychology, 78*, 325-336.

- Locke, E. A. (1976). The nature and causes of job satisfaction. In M. Dunette (Ed.), *Handbook of Industrial and Organisational Psychology*. Palo, Alto: Consulting Psychologists Press.
- Lu, C., Siu, O., & Cooper, C. L. (2005). Managers' occupational stress in China: the role of self-efficacy. *Personality and Individual Differences, 38*, 569-578.
- Lu, C., Siu, O. L., & Cooper, C. L. (2005). Managers' occupational stress in China: the role of self-efficacy. [doi: DOI: 10.1016/j.paid.2004.05.012]. *Personality and Individual Differences, 38*(3), 569-578.
- MacCallum, R. C. (1995). Model specification: Procedures, strategies, and related issues. In R. H. Hoyle (Ed.), *Structural Equation Modeling: Concepts, issues, and application* (pp. 16 - 36). Thousand Oaks, California: Sage Publications, Inc.
- MacCallum, R. C., Roznowski, M., & Necowitz, L. B. (1992). Model modifications in covariance structure analysis: The problem of capitalization on chance. *Psychological Bulletin, 111*(3), 490-504.
- MacKenzie, S. B., Podsakoff, P. M., & Ahearne, M. (1998). Some possible antecedents and consequences of in-role and extra-role salesperson performance. *Journal of Marketing, 62*, 87-98.
- MacKinnon, D. P. (1994). Analysis of mediating variables in prevention and intervention research. *NIDA Research Monograph, 139*, 127-153.
- MacKinnon, D. P., & Dwyer, D. J. (1993). Estimating mediated effects in prevention studies. *Evaluation Review, 17*(2), 144-158.
- MacKinnon, D. P., & Fairchild, A. J. (2009). Current directions in mediation analysis. *Current Directions in Psychological Science, 18*(1), 16-20.
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58*, 593-614.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test the significance of the mediated effect. *Psychological Methods, 7*, 83-104.
- Maddux, J. E. (1995). Self-efficacy theory: An introduction. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 3-33). New York: Plenum Press.

- Maddux, J. E., & Lewis, J. (1995). Self-efficacy and adjustment: Basic principles and issues. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 37-68). New York: Plenum Press.
- Maertz, C. P., & Campion, M. A. (1998). 25 years of voluntary turnover research: A review and critique. *International Review of Industrial and Organisational Psychology, 13*, 49-81.
- Makikangas, A., Feldt, T., Kinnunen, U., Tolvanen, A., Kinnunen, M. L., & Pulkkinen, L. (2006). The Factor Structure and Factorial Invariance of the 12-item General Health Questionnaire (GHQ-12) Across Time: Evidence From Two Community-Based Samples. *Psychological Assessment, 18*(4), 444-451.
- Mansell, A., Brough, P., & Cole, K. (2006). Stable predictors of job satisfaction, psychological strain, and employee retention: An evaluation of organizational change within the New Zealand Customs Service. *International Journal of Stress Management, 13*(1), 84-107.
- Mansor, N., & Ali, M. A. M. (1998). An exploratory study of organizational flexibility in Malaysia: a research note. [Article]. *International Journal of Human Resource Management, 9*(3), 506-515.
- Markus, H., & Kitayama, S. (1991). Culture and self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224-253.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370-396.
- Mathieu, J. E., & Taylor, S. R. (2006). Clarifying conditions and decision points for mediational type inferences in organizational behavior. *Journal of Organizational Behavior, 27*, 1031-1056.
- Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organisational commitment. *Psychological Bulletin, 108*(2), 171-194.
- Matsui, T., & Onglatco, M. L. (1992). Career self-efficacy as a moderator of the relation between occupational stress and strain. *Journal of Vocational Behavior, 41*, 79-88.

- McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin*, 114(2), 376-390.
- McLaney, M. A., & Hurrell, J. J. (1988). Control, stress and job satisfaction in Canadian nurses. *Work and Stress*, 2, 217-224.
- Meier, L. L., Semmer, N., Elfering, A., & Jacobshagen, N. (2008). The double meaning of control: Three-way interaction between internal resources, job control, and stressors at work. *Journal of Occupational Health Psychology*, 13(3), 244-258.
- Meijman, T., & Mulder, G. (1998). Psychological aspects of workload. In P. J. Drenth, H. Thierry & C. J. de Wolff (Eds.), *Handbook of work and organizational psychology* (2nd ed., pp. 5-33). Hove: Erlbaum.
- Melamed, S., Kushnir, T., & Meir, E. I. (1991). Attenuating the impact of job demands: Additive and interactive effects of perceived control and social support. *Journal of Vocational Behavior*, 39, 40-53.
- Meyer, J. P., & Allen, N. (1984). Testing the side bet theory of organizational commitment: some methodological considerations. *Journal of Applied Psychology*, 69, 372-378.
- Meyer, J. P., & Allen, N. (1997). *Commitment in the workplace: Theory, research, and application*. Thousand Oaks: Sage Publication.
- Meyer, J. P., & Allen, N. J. (1991). A three conceptualization of organizational commitment. *Human Resource Management Review*, 1, 61-89.
- Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, 78, 538-551.
- Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of interrelations and outcomes. *Journal of Vocational Behavior*, 61, 20-52.
- Meyer, J. P., Vandenberghe, C., & Becker, T. E. (2004). Employee commitment and motivation: A conceptual analysis and integrative model. *Journal of Applied Psychology*, 89(6), 991-1007.

- Mikkelsen, A., Ogaard, T., & Landsbergis, P. A. (2005). The effects of new dimensions of psychological job demands and job control on active learning and occupational health. *Work and Stress, 19*(2), 153-175.
- Mikkelsen, A., Saksvik, P. O., Eriksen, H. R., & Ursin, H. (1999). The impact of learning opportunities and decision authority on 'healthy work'. *Work & Stress, 13*, 20-31.
- Mischel, L. J., & Northcraft, G. B. (1997). "I think we can, I think we can...": The role of efficacy beliefs in group and team effectiveness. In B. Markovsky, M. J. Lovaglia & L. Troyer (Eds.), *Advances in group processes* (Vol. 14, pp. 177-197). Greenwich, CT: JAI Press.
- Mitchell, T. R., & James, L. R. (2001). Building better theory: Time and the specification of when things happen. *Academy of Management Review, 26*(4), 530-547.
- Mobley, W. H. (1982). Some unanswered questions in turnover and withdrawal research. *Academy of Management Review, 7*(1), 111-116.
- Mobley, W. H., Horner, S. O., & Hollingsworth, A. T. (1978). An evaluation of precursors of hospital employee turnover. *Journal of Applied Psychology, 63*(4), 408-414.
- Moore, J. E. (2000). Why is this happening? A causal attribution approach to work exhaustion consequences. *Academy of Management Review, 25*, 335-349.
- Morgeson, F. P., & Campion, M. A. (2003). Work design. In I. B. Weiner (Ed.), *Handbook of psychology* (pp. 423-453). Chichester: John Wiley & Sons.
- Morgeson, F. P., & Humphrey, S. E. (2006). The work design questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work. *Journal of Applied Psychology, 91*(6), 1321-1339.
- Morrison, D., Cordery, J. L., Girardi, A., & Payne, R. (2005). Job design, opportunities for skill utilization, and intrinsic job satisfaction. *European Journal of Work and Organizational Psychology, 14*(1), 59-79.
- Morrison, E. W. (1994). Role definitions and organizational citizenship behavior: The importance of the employee's perspective. [Article]. *Academy of Management Journal, 37*(6), 1543-1567.

- Mosakowski, E., & Earley, P. C. (2000). A selective review of time assumptions in strategy research. *Academy of Management Review*, 25(4), 796-812.
- Motowidlo, S. J. (2003). Job performance. In W. C. Borman, D. R. Ilgen & R. J. Klimoski (Eds.), *Industrial and organizational psychology* (Vol. 12; Handbook of psychology, pp. 39-53). New York: Wiley.
- Mowday, R. T., Porter, L. W., & Steers, R. M. (1982). *Employee-organization linkages: The psychology of commitment, absenteeism, and turnover*. New York: Academic Press.
- Mullarkey, S., Jackson, P. R., Wall, T. D., Willson, J. R., & Grey-Taylor, S. M. (1997). The impact of technology characteristics and job control on worker mental health. *Journal of Organizational Behavior*, 18, 471-489.
- Mullen, M. R., Milne, G. R., & Doney, P. M. (1995). An international marketing application of outliers analyses for structural equations: A methodological note. *Journal of International Marketing*, 3, 45-62.
- Munro, L., Rodwell, J., & Harding, L. (1998). Assessing occupational stress in psychiatric nurses using the full job strain model: The value of social support to nurses. *International Journal of Nursing Studies*, 35(6), 339-345.
- Myers, D. G. (1999). Close relationships and quality of life. In D. Kahneman, E. Diener & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 374-391). New York: Sage Publication.
- Ng, T. W. H., Sorensen, K. L., & Yim, F. H. K. (2009). Does the Job Satisfaction-Job Performance Relationship Vary Across Cultures? *Journal of Cross-Cultural Psychology*, 40(5), 761-796.
- Noblet, A. (2003). Building health promoting work settings: identifying the relationship between work characteristics and occupational stress in Australia. *Health Promot. Int.*, 18(4), 351-359.
- Noor, S., & Maad, N. (2008). Examining the relationship between work life conflict, stress and turnover intentions among marketing executives in Pakistan. *International Journal of Business and Management*, 3(11), 93-102.
- O'Driscoll, M. P. (2000). Work and family transactions. In P. Koopman-Boyden, A. Dharmalingam, B. Grant, V. Hendy, S. Hillcoat-Nallétamby, D. Mitchell, M. P. O'Driscoll & S. Thompson (Eds.), *Transactions in the mid-*

- life family* (pp. 92-112). Hamilton, NZ: Populations Association of New Zealand.
- O'Driscoll, M. P., & Beehr, T. A. (1994). Supervisor behaviours, role stressors and uncertainty as predictors of personal outcomes for subordinates. *Journal of Organizational Behaviour, 15*, 141-155.
- O'Driscoll, M. P., & Cooper, C. L. (1996). Sources and management of excessive job stress and burnout. In P. B. Warr (Ed.), *Psychology at work* (4th ed., pp. 188-223). Harmondsworth, England: Penguin.
- O'Driscoll, M. P., & Cooper, C. L. (2002). Job-related stress and burnout. In P. Warr (Ed.), *Psychology at work* (5th ed., pp. 203-228). London: Penguin Books.
- O'Driscoll, M. P., & Dewe, P. J. (2001). Mediators and moderators of stressor-strain linkages. In P. L. Perrewé & D. C. Ganster (Eds.), *Research in occupational stress and well-being* (Vol. 1, pp. 257-287). Oxford: JAI Press.
- Odom, R. Y., Boxx, W. R., & Dunn, M. G. (1990). Organizational cultures, commitment, satisfaction, and cohesion. *Public Productivity & Management Review, 14*(2), 157-169.
- Oldham, G. R. (1996). Job design. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 33-60). Chichester: John Wiley & Sons.
- Oldham, G. R., Hackman, J. R., & Pearce, J. L. (1976). Condition under which employees respond positively to enriched work. *Journal of Applied Psychology, 61*, 395-403.
- Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington, MA: Lexington Books.
- Organ, D. W., Podsakoff, P. M., & MacKenzie, S. B. (2006). *Organizational citizenship behavior: Its nature, antecedents, and consequences*. Thousand oaks, CA: Sage Publication.
- Parasuraman, S. (1982). Predicting turnover intentions and turnover behaviour- a multivariate analysis. *Journal of Vocational Behavior, 21*, 111-121.
- Paris, M. A. (2003). Work teams: Perceptions of a readymade support system? *Employee Responsibilities and Rights Journal, 15*, 71-83.

- Parker, S. K., & Sprigg, C. A. (1998). Minimizing strain and maximizing learning: The role of job demands, job control and pro-active learning. *Journal of Applied Psychology, 84*, 925-939.
- Parker, S. K., Turner, N., & Griffin, M. A. (2003). Designing healthy work. In D. A. Hofmann & L. E. Tetrick (Eds.), *Occupational health and safety: A multilevel perspective* (pp. 91-130). San Francisco, CA: Jossey Bass.
- Parker, S. K., & Wall, T. D. (1998). *Job and work design: Organizing work to promote well-being and effectiveness*. Thousand Oaks, London: Sage Publications.
- Parker, S. K., & Wall, T. D. (2001). Work design: Learning from the past and mapping a new terrain. In N. Anderson, D. S. Ones, H. K. Sinangil & C. Viswesvaran (Eds.), *Handbook of Industrial, Work, And Organizational Psychology* (Vol. 1, pp. 90-109). Thousand Oaks: Sage publication.
- Parker, S. K., Wall, T. D., & Cordery, 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., Mendham, C. A., & Von Rabenau, C. (1994). Social support and demand-discretion model of job stress: Test of additive and interactive effects of two samples. *Journal of Vocational Behavior, 44*, 91-113.
- Parmar, N. R. (2001). Job anxiety as a moderator variable in the relationship between job characteristics and individual as well as organizational outcomes. *Journal of the Indian Academy of Applied Psychology, 27*, 75-81.
- Payne, R. L. (1979). Demands, supports and constraints and psychological health. In C. J. Mackay & T. Cox (Eds.), *In response to stress: Occupational aspects* (pp. 85-105). London: IPC Business Press.
- Peeters, M. C. W., & Le Blanc, P. M. (2001). Towards a match between job demands and sources of social support: A study among oncology care providers. *European Journal of Work and Organizational Psychology, 10*, 53-72.
- Pelfrene, E., Vlerick, P., Kittel, F., Mak, R. P., Kornitzer, M., & Backer, G. D. (2002). Psychosocial work environment and psychological well-being: Assessment of the buffering effects in the Job demands-control (-support) model in Belstress. *Stress and Health, 18*, 43-56.

- Podsakoff, N. P., LePine, J. A., & LePine, M. A. (2007). Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: A meta-analysis. *Journal of Applied Psychology, 92*(2), 438-454.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879-903.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effect on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly, 1*, 107-142.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.
- Price, J. L. (1997). Handbook of organizational measurement. *International Journal of Manpower, 18*(4), 305-558.
- Putterill, M., & Rohrer, T. (1995). A causal model of employee commitment in a manufacturing setting. *International Journal of Manpower, 15*, 56-69.
- Quarstein, V. A., McAfee, R. B., & Glassman, M. (1992). The situational occurrences theory of job satisfaction. *Human Relations, 45*(8), 859-873.
- Quick, J. C., Quick, J. D., Nelson, D. L., & Hurrell, J. J. (1997). *Preventive stress management in organization*. Washington, DC: American Psychological Association.
- Rabinowitz, S., & Stumpf, S. A. (1987). Facets of role conflict, role specific performance, and organizational level within the academic career. *Journal of Vocational Behavior, 30*, 72-83.
- Randall, M. L., Cropanzano, R., Borman, W. C., & Birjulin, A. (1999). Organizational politics and organizational support as predictors of work attitudes, job performance, and organizational citizenship behaviours. *Journal of Organizational Behavior, 20*, 159-174.
- Reilly, P. (1998). Balancing flexibility - Meeting the interest of employer and employee. *European Journal of Work and Organizational Psychology, 7*(1), 7-22.

- Rhodes, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology, 87*(4), 698-714.
- Rhodes, L., Eisenberger, R., & Armeli, S. (2002). Affective commitment to the organization: The contribution of perceived organizational support. *Journal of Applied Psychology, 86*(5), 825-836.
- Riggs, M. L., Warka, J., Babasa, B., Betancourt, R., & Hooker, S. (1994). Development and validation of self-efficacy and outcome expectancy scales for job-related applications. *Educational and Psychological Measurement, 54*(3), 793-802.
- Riketta, M. (2008). The causal relation between job attitudes and performance: A meta-analysis of panel studies. *Journal of Applied Psychology, 93*(2), 472-481.
- Rodriguez, I., Bravo, M. J., & Schaufeli, W. B. (2001). The demands-control-support model, locus of control and job dissatisfaction: a longitudinal study. *Work & Stress, 15*, 97-114.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review, 110*(1), 145-172.
- Saari, L. M., & Judge, T. A. (2004). Employee attitudes and job satisfaction. *Human Research Management, 43*(4), 395-407.
- Sainfort, F., & Carayon, P. (1991). Stress, job control and other job elements: A study of office workers. *International Journal of Industrial Ergonomics, 7*, 11-23.
- Sanchez, J. I., & Viswesvaran, C. (2002). The effects of temporal separation on the relations between self-reported work stressors and strains. *Organizational Research Methods, 5*(2), 173-183.
- Sarason, I. G., Sarason, B. R., & Pierce, G. R. (1994). Social support: Global and relationship-based levels of analysis. *Journal of Social and Personal Relationships, 11*(2), 295-312.
- Sargent, L. D., & Terry, D. J. (1998). The effects of work control and job demands on employee adjustment and work performance. *Journal of Occupational and Organizational Psychology, 71*, 219-236.
- Sargent, L. D., & Terry, D. J. (2000). The moderating role of social support in Karasek's job strain model. *Work & Stress, 14*(3), 245-261.

- Schaubroeck, J., Cotton, J. L., & Jennings, K. R. (1989). Antecedents and consequences of role stress: A covariance structure analysis. *Journal of Organizational Behavior*, 10(1), 35-58.
- Schaubroeck, J., Lam, S. S. K., & Xie, J. L. (2000). Collective efficacy versus self-efficacy in coping responses to stressors and control: A cross-cultural study. *Journal of Applied Psychology*, 85(4), 512-525.
- Schaubroeck, J., & Merritt, D. E. (1997). Divergent effects of job control on coping with work stressors: The key role of self-efficacy. *Academy of Management Journal*, 40(3), 738-754.
- Scherer, K. R. (2004). Ways to study the nature and frequency of our daily emotions: Reply to the commentaries on 'emotions in everyday life'. *Social Science Information*, 43(4), 667-689.
- Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, 44(4), 695-729.
- Schermerhorn, J. R., & Bond, M. H. (1997). Cross-cultural leadership dynamics in collectivism and high power distance settings. *Leadership & Organization Development Journal*, 18(4), 187-193.
- Schmidt, K. (2007). Organizational commitment: A further moderator in the relationship between work stress and strain? *International Journal of Stress Management*, 14(1), 26-40.
- Schoenberger, E. (1988). The ambiguous future of professional and technical workers in manufacturing: some hypotheses. *Acta Sociologica*, 31(3), 241-247.
- Scholarios, D., & Marks, A. (2004). Work-life balance and the software worker. *Human Resource Management Journal*, 14(2), 54-74.
- Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Organizational Behavior and Human Performance*, 25, 184-215.
- Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Seligman, M. E. (1975). *Helplessness: On depression, development, and death*. San Francisco: Freeman.
- Semmer, N. (2003). Individual differences, work stress and health. In M. J. Schabracq, J. A. M. Winnubst & C. L. Cooper (Eds.), *Handbook of work and health psychology* (2nd ed., pp. 83-120). Chichester, England: Wiley.

- Setton, R. P., Bennett, N., & Liden, R. C. (1996). Social exchange in organization: Perceived organizational support, leader-member exchange, and employee reciprocity. *Journal of Applied Psychology, 81*, 219-227.
- Shanock, L. R., & Eisenberger, R. (2006). When supervisors feel supported: Relationships with subordinates' perceived supervisor support, perceived organizational support, and performance. *Journal of Applied Psychology, 91*(3), 689-695.
- Shaughnessy, J. J., & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York: McGraw-Hill.
- Shaughnessy, J. J., Zechmeister, E. B., & Zechmeister, J. S. (2006). *Research methods in psychology* (7th ed.). New York: McGraw Hill.
- Shen, Y., & Gallivan, M. (2004). An empirical test of the job demand/control model among IT users *Proceedings of the 2004 SIGMIS conference on Computer personnel research: Careers, culture, and ethics in a networked environment* (pp. 39-47). Tucson, AZ, USA: ACM.
- Shevlin, M., & Adamson, G. (2005). Alternative factor models and factorial invariance of the GHQ-12: A large sample analysis using confirmatory factor analysis. *Psychological Assessment, 17*, 231-236.
- Shimazu, A., De Jonge, J., & Irimajiri, H. (2008). Lagged effects of active coping within the Demand-Control Model: A Three-wave panel study among Japanese employees. [Article]. *International Journal of Behavioral Medicine*
- International Journal of Behavioral Medicine 11 - International Journal of Behavioral Medicine, 15*(1), 44-53.
- Shore, L. M., & Tetrick, L. E. (1991). A construct validity study of the survey of perceived organizational support. *Journal of Applied Psychology, 76*, 637-643.
- Shore, L. M., & Wayne, S. J. (1993). Commitment and employee behavior: Comparison of affective commitment and continuance commitment with perceived organizational support. *Journal of Applied Psychology, 78*, 774-780.
- Singelis, T. M., Triandis, H. C., Bhawuk, D. P. S., & Gelfand, M. J. (1995). Horizontal and vertical dimensions of individualism and collectivism: A

- Theoretical and measurement refinement. *Cross-Cultural Research*, 29(3), 240-275.
- Siu, O. L., Spector, P. E., Cooper, C. L., & Lu, C. Q. (2005). Work stress, self-efficacy, Chinese work values, and work well-being in Hong Kong and Beijing. *International Journal of Stress Management*, 12, 274-288.
- Smith, C. A., Tisak, J., Hahn, S. E., & Schmieder, R. A. (1997). The measurement of job control. *Journal of Organizational Behaviour*, 18, 225-237.
- Soderfeldt, B., Soderfeldt, M., Muntaner, C., O'Campo, P., Warg, L.-E., & Ohlson, C.-G. (1996). Psychosocial work environment in human service organizations: A conceptual analysis and development of the demand-control model. *Social Science & Medicine*, 42, 1217-1226.
- Solinger, O. N., van Olffen, W., & Roe, R. A. (2008). Beyond the three-component model of organizational commitment. *Journal of Applied Psychology*, 93(1), 70-83.
- Sonnetag, S., & Zijlstra, F. R. H. (2006). Job characteristics and off-job activities as predictors of need for recovery, well-being, and fatigue. *Journal of Applied Psychology*, 91, 330-350.
- Spector, P. E. (1986). Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work. *Human Relations*, 39, 1005-1016.
- Spector, P. E. (1997). *Job satisfaction: Application, assessment, causes, and consequences*. Thousand Oaks, London: Sage Publication.
- Spector, P. E. (2002). Employee control and occupational stress. *Current Directions in Psychological Science*, 11(4), 133-136.
- Spector, P. E. (2006). Method variance in organizational research: truth or urban legend? *Organizational Research Methods*, 9, 221-232.
- Spector, P. E., Allen, T. D., Poelmans, S. A. Y., Lapierre, L. M., Cooper, C. L., O'Driscoll, M. P., et al. (2007). Cross-national differences in relationships of work demands, job satisfaction, and turnover intentions with work-family conflict. *Personnel Psychology*, 60(4), 805-834.
- Spector, P. E., Sanchez, J. I., Siu, O. L., Salgado, J., & Ma, J. (2004). Eastern versus Western Control Beliefs at Work: An Investigation of Secondary Control, Socioinstrumental Control, and Work Locus of Control in China and the US. *Applied Psychology: an International Review*, 53(1), 38-60.

- Staw, B. M., & Cohen-Charash, Y. (2005). The dispositional approach to job satisfaction: More than a mirage, but not yet an oasis. *Journal of Organizational Behavior*, 26(1), 59-78.
- Steptoe, A. (2001). Job control, perceptions of control, and cardiovascular activity: An analysis of ambulatory measures collected over the working day. *Journal of Psychosomatic Research*, 50, 57-63.
- Stewart, W., & Barling, J. (1996). Daily work stress, mood and interpersonal job performance: A mediation model. *Work and Stress*, 10, 336-351.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4 ed.). Boston: Allyn & Bacon.
- Tait, R. J., French, D. J., & Hulse, G. K. (2003). Validity and psychometric properties of the general health questionnaire-12 in young Australian adolescents. *Australian and New Zealand Journal of Psychiatry*, 37(3), 374-381.
- ter Doest, L., Maes, D., & Gebhardt, W. A. (2006). Personal goal facilitation through work: Implications for employee satisfaction and well-being. *Applied Psychology: An International Review*, 55(2), 192-219.
- Terry, D. J., & Jimmieson, N. L. (1999). Work control and employee well-being. In C. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (pp. 95-148). Chichester, England: John Wiley.
- Testa, M. R. (2001). Organizational commitment, job satisfaction, and effort in the service environment. *The Journal of Psychology*, 135(2), 226-236.
- Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organisational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology*, 46, 259-293.
- The Star. (2006, 31 March). 1.1 million new jobs. *The Star*.
- Thomas, D. C., & Pekerti, A. A. (2003). Effect of culture on situational determinants of exchange behavior in organizations: A comparison of New Zealand and Indonesia. *Journal of Cross-Cultural Psychology*, 34(3), 269-281.
- Thong, G., & Jain, H. (1987). Learning from the Japanese in Malaysia. *Euro-Asia Business Review*, 6(1), 41-45.

- Tonges, M. C., Rothstein, H., & Carter, H. K. (1998). Sources of satisfaction in hospital nursing practice. *Journal of Nursing Administration*, 28, 47-61.
- Torraco, R. J. (2005). Work design theory: A review and critique with implications for human resource development. *Human Resource Development Quarterly*, 16(1), 85-109.
- Totterdell, P., Wood, S., & Wall, T. (2006). An intra-individual test of the demands-control model: A weekly diary study of psychological strain in portfolio workers. *Journal of Occupational and Organizational Psychology*, 79, 63-84.
- Tremble, T. R., Payne, S. C., Finch, J. F., & Bullis, R. C. (2003). Opening organizational archives to research: analog measures of organizational commitment. *Military Psychology*, 15(3), 167-190.
- Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review*, 96(3), 506-520.
- Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview Press.
- Turner, N., Chmiel, N., & Walls, M. (2005). Railing for safety: Job demands, job control, and safety citizenship role definition. *Journal of Occupational Health Psychology*, 10(4), 504-512.
- Turnley, W. H., Bolino, M. C., Lester, S. W., & Bloodgood, J. M. (2003). The impact of psychological contract fulfillment on the performance of in-role and organizational citizenship behaviors. *Journal of Management*, 29(2), 187-206.
- Udin, Z. M., & Ahmad, H. (2000, 21 - 24 June). *Internet worked manufacturing trends in Malaysia*. Paper presented at the The 5th International Conference on Global Business Economic Development, Managing Global Business in the Internet Age, Beijing.
- Vahtera, J., Kivimaki, M., Pennti, J., & Theorell, T. (2000). Effect of change in the psychosocial work environment on sickness absence: A seven year follow up of initially healthy employees. *Journal of Epidemiology and Community Health*, 54, 484-493.
- van der Doef, M., & Maes, D. (1999). The job demand control support model and psychological well-being: A review of 20 years of empirical research. *Work and Stress*, 13, 87-114.

- Van Scoter, J. R. (1999). Relationships of task performance and contextual performance with turnover, job satisfaction, and affective commitment. *Human Resource Management Review, 10*(1), 79-95.
- Van Vegchel, N., De Jonge, J., & Landsbergis, P. A. (2005). Occupational stress in (inter)action: The interplay between job demands and job resources. *Journal of Organizational Behavior, 26*, 535-560.
- Van Vegchel, N., de Jonge, J., Soderfeldt, M., Dormann, C., & Schaufeli, W. B. (2004). Quantitative versus emotional demands among Swedish human service employees: Moderating effects of job control and social support. *International Journal of Stress Management, 11*(1), 21-40.
- van Veldhoven, M., Taris, T. W., de Jonge, J., & Broersen, S. (2005). The relationship between work characteristics and employee health and well-being: How much complexity do we really need? *International Journal of Stress Management, 12*(1), 3-28.
- Van Yperen, N., & Hagedoorn, M. (2003). Do high job demands increase intrinsic motivation or fatigue or both? The role of job control and job social support. *Academy of Management Journal, 46*(3), 339-348.
- Van Yperen, N., & Snijders, T. A. M. (2000). A multilevel analysis of the demands-control model: Is stress at work determined by factors at the group or at the individual level? *Journal of Occupational Health Psychology, 5*, 182-190.
- Vandenberg, R. J., & Nelson, J. B. (1999). Disaggregating the motives underlying turnover intentions: When do intentions predict turnover behavior? *Human Relations, 52*(10), 1313-1336.
- Vermeulan, M., & Mustard, C. (2000). Gender differences in job strain, social support at work, and psychological distress. *Journal of Occupational Health Psychology, 5*, 428-440.
- Viswesvaran, C., Sanchez, J., & Fisher, J. (1999). The role of social support in the process of work stress: A meta analysis. *Journal of Vocational Behavior, 54*, 314-334.
- Vroom, V. (1965). *Motivation in management*. New York: American Foundation for Management Research.

- Wall, T., Jackson, P. R., & Mullarkey, S. (1995). Further evidence on some new measures of job control, cognitive demand and production responsibility. *Journal of Organizational Behaviour*, *16*, 431-455.
- Wall, T. D., Jackson, P. R., & Mullarkey, S. (1995). Further evidence on some new measures of job control, cognitive demand and production responsibility. *Journal of Organizational Behavior*, *16*, 431-455.
- Wall, T. D., Jackson, P. R., Mullarkey, S., & Parker, S. K. (1996). The demands-control model of job strain: A more specific test. *Journal of Occupational and Organizational Psychology*, *69*, 153-166.
- Wall, T. D., Wood, S. J., & Leach, D. J. (2004). Empowerment and performance. In C. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 19, pp. 1-46). Chichester: Wiley.
- Walters, D. (1998). Health and safety strategies in a changing Europe. *International Journal of Health Services*, *28*(2), 305-331.
- Warr, P. (2002). *Psychology at work* (5th ed.). London: Penguin Books.
- Warr, P., Cook, J., & Wall, T. (1979a). Scale for the measurement of some work attitudes and aspects of psychological well-being. *Journal of Occupational Psychology*, *52*, 129-148.
- Warr, P., Cook, J., & Wall, T. (1979b). Scales for the measurement of some work attitudes and aspect of psychological well-being. *Journal of Occupational Psychology*, *52*, 129-148.
- Watson, D. (2000). *Mood and temperament*. New York: Guilford Press.
- Way, M., & MacNeil, M. (2006). Organizational characteristics and their effect on Health. *Nursing Economic\$, 24*(2), 67-77.
- Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management Journal*, *40*, 82-111.
- Werneke, U., Goldberg, D. P., & Ustun, B. T. (2000). The stability of the factor structure of the General Health Questionnaire. *Psychological Medicine*, *30*, 823-829.
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural Equation Modeling: Concepts, Issues, and Applications*. Thousand Oaks, CA: Sage Publications.

- Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, *17*(3), 601-617.
- Winefield, A. H., Boyd, C., Saebel, J., & Pignata, S. (2008). *Job stress in university staff*. Bowen Hills Qld, Australia: Australian Academic Press.
- Winefield, H. R., Goldney, R. D., Winefield, A. H., & Tiggemann, M. (1989). The General Health Questionnaire:reliability and validity for Australian youth. *Australia and New Zealand Journal of Psychiatry*, *23*, 53-58.
- Wright, T. A. (2006). The emergence of job satisfaction in organisational behavior: A historical overview of the dawn of job attitude research. *Journal of Management History*, *12*(3), 262-277.
- Wright, T. A., & Bonnet, D. G. (1997). The contribution of burnout to work performance. *Journal of Organizational Behavior*, *18*, 491-499.
- Wright, T. A., & Cropanzano, R. (1998). Emotional exhaustion as a predictor of job performance and voluntary turnover. *Journal of Applied Psychology*, *83*, 486-493.
- Wright, T. A., & Cropanzano, R. (2000). The role of organizational behavior in occupational health psychology: A view as we approach the millenium. *Journal of Occupational Health Psychology*, *5*, 5-10.
- Wright, T. A., & Cropanzano, R. (2004). The role of psychological well-being in job performance: A fresh look at an age-old quest. *Organizational Dynamics*, *33*(4), 338-351.
- Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2007). The role of personal resources in the Job Demands-Resources model. *International Journal of Stress Management*, *14*, 121-141.
- Xie, J. (1996). Karasek's model in the people republic of China: Effects of job demands, control, and individual differences. *Academy of Management Journal*, *39*(6), 1594-1618.
- Yeung, D. Y. L., & Tang, C. S. (2001). Impact of Job Characteristics on Psychological Health of Chinese Single Working Women. *Women & Health*, *33*, 95-111.
- Yeung, J. C. K. (2008). Role of traditional values on coping with stress among manufacturing workers in China: An empirical study. *International Journal of Management*, *25*(2), 224-236.

- Ylipaavalniemi, J., Kivimaki, M., Elovainio, M., Virtanen, M., Jarvinen, L. K., & Vahtera, J. (2005). Psychosocial work characteristics and incidence of newly diagnosed depression: A prospective cohort study of three different models. *Social Science & Medicine*, *61*, 111-122.
- Young, L., Baltes, B., & Pratt, A. (2007). Using selection, optimization, and compensation to reduce job/family stressors: effective when it matters. [Article]. *Journal of Business & Psychology*, *21*(4), 511-539.
- Zafirovski, M. (2005). Social exchange theory under scrutiny: A positive critique of its economics-behaviorist formulations. *Electronic Journal of Sociology* Retrieved 20 October, 2009, from <http://www.sociology.org/content/2005/tier2/SETheory.pdf>
- Zaheer, S., Albert, S., & Zaheer, A. (1999). Time scales and organizational theory. *Academy of Management Review*, *24*(4), 725-741.
- Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with reference to methodological. *Journal of Occupational Health Psychology*, *1*, 145-169.

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Appendix A: Questionnaire (English version)

Impact of Work Design on Psychological work reactions and Performance among Technical Workers: A Longitudinal Study in Malaysia.

Dear Participant,

The purpose of this research is to investigate the impact of work design on psychological work reaction and job performance among technical workers. This research aims to explore the possibility of improving the quality of life among technical workers. The output of this research will use to help government and your organisation to provide a guideline to develop a conducive work environment. You have been selected to represent technical workers population to provide information about the research and share your experience with us. It will take 15-20 minutes to complete this questionnaire. Naturally, your participation in the research is completely voluntary and if you participate, you need not respond to all the questions.

Please be assured that your responses will be treated with the utmost confidentiality. This means that your personal information will never be identified in any presentations or reports of the results. Reports and publications arising from this study will be based on combined data only, and will contain no information which would identify you personally. All completed surveys will be kept in a safe and secure location for period of 3 years, after which they will be destroyed.

When you have completed this questionnaire, please return it to me or your supervisor in the postage-paid envelope provided. I would appreciate if you can complete the questionnaire within the next two weeks. It is assumed that your consent will be given by the return of the questionnaire, but if for any reason you no longer wish to participate please do not feel pressured to return the questionnaire. You have the right to withdraw from the research at any time.

I expect to have the preliminary results of my research in approximately six months, and would be happy to share them with you. You can contact me or my supervisors for these results. If you have any questions or concerns about this study, feel free to contact us.

I also enclosed a gift as my appreciation for your help and support in this important research. Thank you very much for your time and participation.

Sincerely,

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The following items still correspond to your work tasks. Please indicate the response that most accurately reflects your feelings toward your tasks. Circle one of the number in the boxes according to the scales below:

- 1 = strongly disagree 4 = agree
 2 = moderately disagree 5 = moderately agree
 3 = disagree 6 = strongly agree

SD 1	36	My job requires that I learn new things.	1	2	3	4	5	6
SD 2	37	My job involves a lot of repetitive work.	1	2	3	4	5	6
SD 3	38	My job requires me to be creative.	1	2	3	4	5	6
SD 4	39	My job requires a high level of skill.	1	2	3	4	5	6
SD 5	40	I get to do a variety of different things on my job.	1	2	3	4	5	6
SD 6	41	I have an opportunity to develop my own special ability.	1	2	3	4	5	6
DA 1	42	My job allows me to make a lot of decisions on my own.	1	2	3	4	5	6
DA 2	43	On my job, I have very little freedom to decide how I do my work. (R)	1	2	3	4	5	6
DA 3	44	I have a lot of say about what happens on my job.	1	2	3	4	5	6

SECTION E

The next set of items deals with various aspects of your job. I would like to find out how satisfied you are with areas of your job? Please choose one of the following responses for each item by circling the number in the box.

1 = very dissatisfied

2 = moderately dissatisfied

3 = dissatisfied

4 = not sure

5 = satisfied

6 = moderately satisfied

7 = very satisfied

JS 1	85	The physical work conditions.	1	2	3	4	5	6	7
JS 2	86	The freedom to choose your own method of working.	1	2	3	4	5	6	7
JS 3	87	Your fellow workers.	1	2	3	4	5	6	7
JS 4	88	The recognition you get for good work.	1	2	3	4	5	6	7
JS 5	89	Your immediate boss.	1	2	3	4	5	6	7
JS 6	90	The amount of responsibility you are given.	1	2	3	4	5	6	7
JS 7	91	Your rate of pay.	1	2	3	4	5	6	7
JS 8	92	Your opportunity to use your abilities.	1	2	3	4	5	6	7
JS 9	93	Relationship between management and workers in your organisation.	1	2	3	4	5	6	7
JS 10	94	You chance of promotion.	1	2	3	4	5	6	7
JS 11	95	The way your firm is managed.	1	2	3	4	5	6	7
JS 12	96	The attention paid to suggestions you make.	1	2	3	4	5	6	7
JS 13	97	Your hours of work.	1	2	3	4	5	6	7
JS 14	98	The amount of variety in your job.	1	2	3	4	5	6	7
JS 15	99	Your job security.	1	2	3	4	5	6	7
OJS 1	100	Now, taking everything into consideration, how do you feel about your job as a whole?	1	2	3	4	5	6	7

SECTION F

Think about your ability to do the tasks required by your job. When answering the following questions, answer in reference to your own personal work skills and abilities to perform your job. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Your responses will kept in absolute confidence. Please read each statement carefully, and then circle the number in box that corresponds to the number on the scale.

- | | |
|---------------------------|-------------------------|
| 1 = very inaccurate | 4 = not sure |
| 2 = moderately inaccurate | 5 = accurate |
| 3 = inaccurate | 6 = moderately accurate |
| | 7 = very accurate |

SE 1	101	I am confident in my ability to do my job.	1	2	3	4	5	6	7
SE 2	102	I have all the skills needed to perform my job very well.	1	2	3	4	5	6	7
SE 3	103	I am expert at my job.	1	2	3	4	5	6	7
SE 4	104	I am proud of my job skills and abilities.	1	2	3	4	5	6	7
SE 5	105	There are some tasks required by my job that I cannot do well. (R)	1	2	3	4	5	6	7
SE 6	106	When my performance is poor, it is due to my lack of ability. (R)	1	2	3	4	5	6	7
SE 7	107	I doubt my ability to do my job. (R)	1	2	3	4	5	6	7
SE 8	108	Most people in my line of work can do this job better than I can. (R)	1	2	3	4	5	6	7
SE 9	109	My future in this job is limited because of my lack of skills. (R)	1	2	3	4	5	6	7
SE 10	110	I feel threatened when others watch me work. (R)	1	2	3	4	5	6	7

SECTION I

Using the response scale shown below, when you are having problems in your job in general, please indicate how often your **supervisor** provide you with each of the following? Please choose one of the following responses for each item.

- 1 = never 4 = often
 2 = rarely 5 = very often
 3 = sometimes 6 = all the time

SVISOR 1	127	Helpful information or advice?	1	2	3	4	5	6
SVISOR 2	128	Sympathetic understanding and concern?	1	2	3	4	5	6
SVISOR 3	129	Clear and helpful feedback?	1	2	3	4	5	6
SVISOR 4	130	Practical assistance?	1	2	3	4	5	6

Finally, please answer the following questions about yourself. Your response will be used for classification purposes only.

- Age: _____ years
- Gender (circle): Female Male
- Marital status (please **tick (/)**):
 Married Single Widow Divorce
- Education Level (Please tick (/) **highest**):
 SPM/STPM Bachelors Degree
 Diploma Masters Degree
- Current position (Please **tick (/)**):
 Assistant Technical Officer Semi Multi Skill Technician Skilled Technician
- Status of service (Please **tick (/)**):
 Permanent Probation Contract
- How **long** you have been in your:
 (a) Current job? _____ (b) Company? _____
- Please write the **date** you completed the questionnaire here: _____

Thank you for completing this questionnaire and for being part of my study. I appreciate the time and energy you have given to this study, and value your contribution to its outcomes.

Appendix B: Questionnaire (Malay Version)

No Siri: _____

BORANG SOAL SELIDIK



IMPAK PSIKOSOSIAL REKABENTUK KERJA DI KALANGAN PEKERJA TEKNIKAL: KAJIAN LONGITUDINAL DI MALAYSIA

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Assalamu'alaikum/Salam sejahtera,

Tuan/puan,

Kajian ini bertujuan untuk mengenalpasti impak psikososial rekabentuk kerja ke atas reaksi psikologi and prestasi kerja di kalangan pekerja teknikal di Malaysia. Kajian ini merupakan salah satu usaha untuk mengenalpasti kaedah meningkatkan kualiti hidup para pekerja teknikal. Dapatan kajian ini akan digunakan untuk membantu kerajaan dan pihak organisasi menyediakan garis panduan untuk menyediakan persekitaran kerja yang kondusif. Oleh itu, anda telah terpilih untuk mewakili populasi pekerja teknikal bagi menyediakan maklumat yang berkaitan serta berkongsi pengalaman dengan kami. Ianya mengambil masa selama 10-15 minit untuk melengkapkan borang soal-selidik ini. Penyertaan anda dalam kajian ini adalah secara sukarela.

Segala maklumat yang diberikan adalah **sulit**. Identiti peribadi tidak akan didedahkan dalam mana-mana pembentangan atau penulisan. Ini bermakna laporan dan penulisan hasil dari kajian ini adalah berdasarkan kombinasi data dan tidak mengandungi maklumat yang berkaitan dengan anda secara personal. Semua soal-selidik yang telah lengkap akan disimpan di tempat selamat untuk jangkamasa tiga tahun, dan selepas itu akan dimusnahkan. Maklumat yang diberikan hanyalah untuk kegunaan dalam kajian ini.

Mohon bantuan saudara/i untuk mengembalikan borang soal selidik yang telah lengkap dalam tempoh dua minggu dengan memasukkan dalam sampul surat yang disediakan dan serahkan kepada penyelia anda atau pos terus kepada saya. Kesediaan saudara/i untuk mengisi borang soal-selidik ini menandakan persetujuan anda untuk menyertai kajian ini. Walagaimanapun, sekiranya anda tidak lagi ingin menyertai kajian ini, jangan berasa tertekan untuk mengembalikan borang soal selidik ini. Anda mempunyai hak untuk menarik diri dari kajian ini pada bila-bila masa.

Hasil kajian ini dijangka siap dalam tempoh enam bulan selepas kami memperolehi kesemua borang soal-selidik. Kami amat berbesar hati untuk berkongsi hasil kajian ini dengan saudara/i. Sekiranya saudara/i berminat terhadap hasil kajian ini atau mempunyai sebarang kemusykilan, saudara/i boleh menulis surat, email atau telefon terus kepada saya atau penyelia saya.

Bersama ini disertakan cenderahati sebagai tanda penghargaan kami di atas sokongan anda terhadap kajian yang sangat penting ini. Terima kasih di atas kerjasama anda dalam menjayakan kajian ini.

Salam ikhlas,

Siti Aisyah Panatik (Pelajar PhD)

Prof. Dr. Michael O'Driscoll

Dr. Marc H. Anderson

Kajian ini telah diluluskan oleh Lembaga Etika Penyelidikan, Jabatan Psikologi, University of Waikato. Penyelidik merupakan pensyarah di Universiti Teknologi Malaysia dan sedang melanjutkan pelajaran di peringkat kedoktoran.

SEKSYEN A

Seksyen ini adalah berkaitan dengan tugas-tugas anda. Sila bulatkan nombor dalam kotak yang paling tepat menggambarkan perasaan anda terhadap tugas anda berdasarkan skala berikut:

		Sangat banyak				
		Agak banyak				
		Sederhana				
		Sedikit sahaja				
		Tidak sama sekali				
1	Adakah kerja anda memerlukan perhatian yang tidak berbelah bagi daripada anda?	1	2	3	4	5
2	Adakah anda kena mengesan semula (<i>keep track</i>) lebih daripada satu proses dalam satu masa?	1	2	3	4	5
3	Adakah anda kena memberi tumpuan untuk melihat kesilapan berlaku dalam kerja anda?	1	2	3	4	5
4	Adakah anda kena bertindak dengan cepat untuk mengelakkan masalah-masalah timbul?	1	2	3	4	5
5	Adakah anda diperlukan untuk melayani masalah yang sukar diselesaikan?	1	2	3	4	5
6	Adakah anda kena menyelesaikan masalah yang tidak ada penyelesaian yang jelas?	1	2	3	4	5
7	Adakah anda perlu menggunakan pengetahuan dalam proses pengeluaran untuk membantu mengelak masalah-masalah timbul dalam kerja anda?	1	2	3	4	5
8	Adakah masalah-masalah yang anda layani memerlukan pengetahuan proses pengeluaran yang mendalam dalam bidang anda?	1	2	3	4	5
9	Adakah anda melalui masalah-masalah dalam kerja anda yang mana anda tidak pernah lalui sebelum ini?	1	2	3	4	5
10	Bolehkah kehilangan tumpuan semasa anda melakukan kerja menyebabkan kerosakan teruk terhadap peralatan atau mesin?	1	2	3	4	5
11	Bolehkah kesilapan yang anda lakukan menyebabkan kerosakan teruk terhadap peralatan atau mesin?	1	2	3	4	5

		Sangat banyak				
		Agak banyak				
		Sederhana				
		Sedikit sahaja				
		Tidak sama sekali				
12	Bolehkah kewaspadaan anda mengelakkan kerosakan teruk terhadap peralatan atau mesin?	1	2	3	4	5
13	Bolehkah kewaspadaan anda mengelakkan kehilangan hasil yang berharga?	1	2	3	4	5
14	Sekiranya anda gagal menyedari sesuatu masalah, adakah ia menyebabkan kehilangan produktiviti yang berharga?	1	2	3	4	5
15	Adakah anda menentukan sendiri urutan perkara-perkara yang anda lakukan?	1	2	3	4	5
16	Adakah anda menentukan sendiri bila untuk memulakan sesuatu kerja?	1	2	3	4	5
17	Adakah anda menentukan sendiri bila untuk menyiapkan sesuatu kerja?	1	2	3	4	5
18	Adakah anda menetapkan sendiri tahap kecepatan untuk melakukan kerja anda?	1	2	3	4	5
19	Bolehkah anda mengawal berapa banyak yang anda hasilkan?	1	2	3	4	5
20	Bolehkah anda mengubah cara-cara untuk melakukan kerja anda?	1	2	3	4	5
21	Adakah anda merancang kerja anda sendiri?	1	2	3	4	5
22	Bolehkah anda mengawal kualiti tentang apa yang anda hasilkan?	1	2	3	4	5
23	Bolehkah anda menentukan bagaimana untuk menyiapkan kerja anda?	1	2	3	4	5
24	Bolehkah anda memilih kaedah-kaedah yang hendak digunakan untuk melaksanakan kerja anda?	1	2	3	4	5

Item-item berikutnya masih berkaitan berkaitan dengan kerja anda. **Bulatkan** salah satu nombor di dalam kotak berdasarkan skala respon di bawah yang paling tepat menggambarkan perasaan anda terhadap kerja anda.

		Sentiasa			
		Kerap			
		Kadang-kadang			
		Tidak pernah			
		1	2	3	4
25	Adakah anda kena bekerja dengan sangat cepat?	1	2	3	4
26	Adakah anda mempunyai terlalu banyak kerja untuk dilakukan?	1	2	3	4
27	Adakah anda kena bekerja lebih kuat untuk menyiapkan satu-satu tugas?	1	2	3	4
28	Adakah anda bekerja di bawah tekanan masa?	1	2	3	4
29	Adakah anda kena tergesa-gesa untuk melakukan kerja anda?	1	2	3	4
30	Bolehkah anda melakukan kerja anda dengan selesa?	1	2	3	4
31	Adakah anda kena melayani lebihan kerja dalam kerja anda?	1	2	3	4
32	Adakah anda mempunyai terlalu sedikit kerja?	1	2	3	4
33	Adakah anda mempunyai masalah dengan kadar kecepatan kerja anda?	1	2	3	4
34	Adakah anda mempunyai masalah dengan bebanan kerja?	1	2	3	4
35	Adakah anda berharap anda boleh bekerja dengan langkah yang mudah?	1	2	3	4

Item yang berikutnya masih lagi berkaitan dengan kerja anda. Pilih skala respon yang paling tepat menggambarkan perasaan anda terhadap kerja anda. Bulatkan salah satu nombor dalam kotak berdasarkan skala di bawah:

		Sangat setuju					
		Sederhana setuju					
		Agak setuju					
		Agak tidak setuju					
		Sederhana tidak setuju					
		Sangat tidak setuju					
36	Kerja saya memerlukan saya mempelajari perkara-perkara baru.	1	2	3	4	5	6
37	Kerja saya melibatkan banyak kerja yang berulang-ulang.	1	2	3	4	5	6
38	Kerja saya memerlukan saya bersifat kreatif.	1	2	3	4	5	6
39	Kerja saya memerlukan tahap kemahiran yang tinggi.	1	2	3	4	5	6
40	Saya dapat melakukan berbagai-bagai tugas yang berbeza dalam kerja saya.	1	2	3	4	5	6
41	Saya mempunyai peluang untuk membangunkan kebolehan istimewa saya.	1	2	3	4	5	6
42	Kerja saya membenarkan saya untuk membuat banyak keputusan sendiri.	1	2	3	4	5	6
43	Dalam kerja saya, saya mempunyai sangat sedikit kebebasan untuk menentukan bagaimana saya melakukan kerja saya.	1	2	3	4	5	6
44	Saya mempunyai banyak peluang bersuara tentang apa yang berlaku dalam kerja saya.	1	2	3	4	5	6

SEKSYEN B

Untuk setiap item di bawah, sila tandakan sejauhmana anda bersetuju atau tidak dengan setiap pernyataan tersebut. **Bulatkan** nombor di dalam kotak yang paling tepat menggambarkan diri anda berdasarkan skala berikut:

		Sangat setuju						
		Sederhana setuju						
		Agak setuju						
		Tidak pasti						
		Agak tidak setuju						
		Sederhana tidak setuju						
		Sangat tidak setuju						
45	Kehadiran saya di tempat kerja adalah lebih daripada kebiasaan.	1	2	3	4	5	6	7
46	Saya memaklumkan terlebih dahulu apabila tidak boleh datang ke tempat kerja.	1	2	3	4	5	6	7
47	Saya mengambil waktu rehat yang bukan hak saya.	1	2	3	4	5	6	7
48	Saya menggunakan masa yang banyak untuk berbual hal peribadi melalui telefon di waktu kerja.	1	2	3	4	5	6	7
49	Saya komplek mengenai perkara yang remeh-temeh di tempat kerja.	1	2	3	4	5	6	7
50	Saya menjaga dan melindungi harta milik syarikat.	1	2	3	4	5	6	7
51	Saya setia kepada peraturan-peraturan informal untuk mengekalkan susunan kerja yang teratur.	1	2	3	4	5	6	7
52	Saya membantu rakan-rakan sekerja yang tidak dapat hadir bekerja.	1	2	3	4	5	6	7
53	Saya membantu rakan-rakan sekerja yang mempunyai banyak bebanan kerja.	1	2	3	4	5	6	7
54	Saya membantu penyelia saya dalam melakukan kerjanya (walaupun tidak di minta).	1	2	3	4	5	6	7
55	Saya mengambil masa untuk mendengar masalah dan kebimbangan rakan-rakan sekerja saya.	1	2	3	4	5	6	7

		Sangat setuju						
		Sederhana setuju						
		Agak setuju						
		Tidak pasti						
		Agak tidak setuju						
		Sederhana tidak setuju						
		Sangat tidak setuju						
56	Saya berusaha untuk membantu pekerja-pekerja baru.	1	2	3	4	5	6	7
57	Saya mengambil kesempatan untuk kepentingan peribadi ke atas pekerja-pekerja lain.	1	2	3	4	5	6	7
58	Saya menyampaikan maklumat kepada rakan-rakan sekerja saya.	1	2	3	4	5	6	7
59	Saya menunaikan semua tanggungjawab yang dikhususkan kepada saya.	1	2	3	4	5	6	7
60	Saya menemui secara berkekalan tahap keperluan prestasi formal yang diperlukan oleh pekerjaan saya.	1	2	3	4	5	6	7
61	Saya melakukan kerja dengan teliti sebagaimana yang diharapkan ke atas saya.	1	2	3	4	5	6	7
62	Saya menyelesaikan dengan sempurna semua tugas yang ditetapkan kepada saya.	1	2	3	4	5	6	7
63	Kadang-kadang saya gagal melaksanakan tugas-tugas penting dalam kerja saya.	1	2	3	4	5	6	7
64	Kadang-kadang saya mengabaikan beberapa aspek dalam kerja yang dipertanggungjawabkan kepada saya untuk melaksanakannya.	1	2	3	4	5	6	7
65	Saya terikat dengan aktiviti yang akan memberi kesan secara langsung terhadap penilaian prestasi saya.	1	2	3	4	5	6	7

SEKSYEN C

Bagi setiap item di bawah, sila tandakan tahap anda bersetuju atau tidak dengan setiap pernyataan tersebut. **Bulatkan** salah satu nombor didalam kotak yang paling tepat menggambarkan diri anda berdasarkan skala berikut:

		Sangat setuju						
		Sederhana setuju						
		Agak setuju						
		Tidak pasti						
		Agak tidak setuju						
		Sederhana tidak setuju						
		Sangat tidak setuju						
66	Saya tidak mempunyai perasaan kekitaan yang kuat terhadap syarikat ini.	1	2	3	4	5	6	7
67	Saya tidak terasa terikat secara emosi terhadap syarikat ini.	1	2	3	4	5	6	7
68	Syarikat ini sangat bermakna terhadap diri saya	1	2	3	4	5	6	7
69	Saya tidak terasa “sebahagian daripada keluarga” dalam syarikat ini.	1	2	3	4	5	6	7
70	Saya fikir bahawa saya boleh terikat secara mudah dengan syarikat lain seperti saya terikat dengan syarikat saya.	1	2	3	4	5	6	7
71	Saya sangat gembira untuk menghabiskan keseluruhan kerjaya saya di syarikat ini.	1	2	3	4	5	6	7
72	Saya seronok membincangkan syarikat saya dengan orang luar daripada syarikat ini.	1	2	3	4	5	6	7
73	Saya sangat merasakan bahawa masalah yang dihadapi oleh syarikat ini adalah masalah saya juga.	1	2	3	4	5	6	7
74	Saya banyak terfikir tentang keluar dari syarikat ini.	1	2	3	4	5	6	7
75	Saya aktif mencari syarikat lain untuk membolehkan saya keluar dari syarikat ini.	1	2	3	4	5	6	7
76	Saya ingin meninggalkan syarikat ini secepat yang mungkin sekiranya boleh.	1	2	3	4	5	6	7

SEKSYEN D

Sila tandakan tahap anda bersetuju atau tidak dengan setiap pernyataan di bawah. **Bulatkan** salah satu daripada nombor di dalam kotak yang paling tepat menggambarkan diri anda berdasarkan skala berikut:

		Sangat setuju						
		Sederhana setuju						
		Agak setuju						
		Tidak pasti						
		Agak tidak setuju						
		Sederhana tidak setuju						
		Sangat tidak setuju						
77	Syarikat saya sangat mempertimbangkan matlamat dan nilai saya.	1	2	3	4	5	6	7
78	Syarikat saya sangat mengambil berat terhadap kesejahteraan saya.	1	2	3	4	5	6	7
79	Syarikat saya menunjukkan sangat sedikit ambil berat terhadap saya.	1	2	3	4	5	6	7
80	Syarikat saya sentiasa memaafkan kesilapan yang saya tidak sengajakan.	1	2	3	4	5	6	7
81	Syarikat saya mengambil berat terhadap pandangan-pandangan saya.	1	2	3	4	5	6	7
82	Sekiranya ada peluang, syarikat saya akan mengambil kesempatan ke atas diri saya.	1	2	3	4	5	6	7
83	Pertolongan sentiasa tersedia daripada syarikat saya apabila saya menghadapi masalah.	1	2	3	4	5	6	7
84	Syarikat saya akan membantu saya apabila saya memerlukan bantuan.	1	2	3	4	5	6	7

SEKSYEN E

Item-item berikut adalah berkaitan dengan pelbagai aspek dalam pekerjaan anda. Sila tandakan sejauhmana anda berpuas hati atau tidak dengan setiap aspek dalam pekerjaan anda sekarang. **Bulatkan** salah satu nombor di dalam kotak yang paling tepat menggambarkan perasaan anda berdasarkan skala berikut:

		Sangat puas						
		Sederhana puas						
		Agak puas						
		Tidak pasti						
		Agak tidak puas						
		Sederhana tidak puas						
		Sangat tidak puas						
85	Keadaan fizikal tempat kerja.	1	2	3	4	5	6	7
86	Kebebasan untuk memilih sendiri kaedah melakukan kerja.	1	2	3	4	5	6	7
87	Rakan sekerja anda.	1	2	3	4	5	6	7
88	Penghargaan yang anda perolehi hasil daripada kerja yang baik.	1	2	3	4	5	6	7
89	Penyelia anda.	1	2	3	4	5	6	7
90	Jumlah tanggungjawab yang diberikan kepada anda.	1	2	3	4	5	6	7
91	Kadar gaji anda.	1	2	3	4	5	6	7
92	Peluang anda untuk menggunakan kebolehan diri.	1	2	3	4	5	6	7
93	Hubungan antara pihak pengurusan dan pekerja bawahan di syarikat anda.	1	2	3	4	5	6	7
94	Peluang kenaikan pangkat anda.	1	2	3	4	5	6	7
95	Cara syarikat anda diuruskan.	1	2	3	4	5	6	7
96	Perhatian yang diberikan terhadap cadangan yang anda berikan.	1	2	3	4	5	6	7
97	Waktu anda bekerja.	1	2	3	4	5	6	7
98	Jumlah kepelbagaian tugas dalam kerja anda.	1	2	3	4	5	6	7
99	Jaminan kerja anda.	1	2	3	4	5	6	7
100	Sekarang, pertimbangkan semua perkara, sejauhmana perasaan anda terhadap pekerjaan anda secara keseluruhan.	1	2	3	4	5	6	7

SEKSYEN F

Item-item berikutnya berkaitan dengan kebolehan anda dalam melakukan tugas-tugas yang diperlukan oleh pekerjaan anda. Gambarkan diri anda secara umum sebagaimana anda sekarang, bukan seperti yang anda harapkan untuk masa hadapan. Gunakan skala di bawah untuk menggambarkan sejauhmana tepatnya setiap pernyataan tersebut menggambarkan diri anda yang sebenar. Baca setiap pernyataan tersebut dengan cermat, dan **bulatkan** nombor di dalam kotak berdasarkan skala yang disediakan.

		Sangat tepat						
		Sederhana tepat						
		Agak tepat						
		Tidak pasti						
		Agak tidak tepat						
		Sederhana tidak tepat						
		Sangat tidak tepat						
101	Saya yakin dengan kebolehan saya dalam melakukan kerja saya.	1	2	3	4	5	6	7
102	Saya mempunyai semua kemahiran yang diperlukan untuk melakukan kerja saya dengan sangat baik.	1	2	3	4	5	6	7
103	Saya mahir dalam kerja saya.	1	2	3	4	5	6	7
104	Saya bangga dengan kemahiran dan kebolehan kerja saya.	1	2	3	4	5	6	7
105	Terdapat beberapa tugas yang diperlukan oleh pekerjaan saya yang saya tidak boleh melakukan dengan baik.	1	2	3	4	5	6	7
106	Apabila prestasi kerja saya lemah, ianya disebabkan oleh kurangnya kebolehan diri saya.	1	2	3	4	5	6	7
107	Saya ragu-ragu dengan kebolehan diri saya dalam melakukan kerja saya.	1	2	3	4	5	6	7
108	Kebanyakan orang dalam pekerjaan yang sama dengan saya boleh melakukan kerja ini dengan lebih baik daripada saya.	1	2	3	4	5	6	7
109	Masa depan saya dalam pekerjaan ini adalah terhad disebabkan kekurangan kemahiran.	1	2	3	4	5	6	7
110	Saya merasa terancam/terganggu apabila ada orang lain melihat saya melakukan kerja saya.	1	2	3	4	5	6	7

SEKSYEN G

Sila tandakan samada anda mengalami situasi-situasi dibawah dalam tempoh tiga bulan yang lepas. Bulatkan nombor di dalam kotak bagi menggambarkan tahap sejauhmana anda mengalami situasi-situasi tersebut berdasarkan skala berikut:

		Sepanjang masa					
		Sangat selalu		Selalu		Kadang-kadang	
		Jarang-jarang		Tidak pernah			
111	Boleh memberi tumpuan terhadap apa yang anda lakukan?	1	2	3	4	5	6
112	Kehilangan banyak masa tidur disebabkan terlalu bimbang?	1	2	3	4	5	6
113	Merasakan anda memainkan bahagian yang berguna dalam sesuatu perkara?	1	2	3	4	5	6
114	Merasakan cekap membuat keputusan tentang sesuatu perkara?	1	2	3	4	5	6
115	Merasakan berterusan dalam keadaan tegang?	1	2	3	4	5	6
116	Merasakan anda tidak boleh menyelesaikan kesusahan yang anda hadapi?	1	2	3	4	5	6
117	Boleh berseronok dengan aktiviti-aktiviti normal harian anda?	1	2	3	4	5	6
118	Boleh menghadapi masalah-masalah anda?	1	2	3	4	5	6
119	Berasa tidak gembira dan murung?	1	2	3	4	5	6
120	Hilang keyakinan terhadap diri sendiri?	1	2	3	4	5	6
121	Memikirkan diri anda sebagai orang yang tidak bergunah?	1	2	3	4	5	6
122	Merasa gembira secara munasabah, setelah mempertimbangkan semua perkara.	1	2	3	4	5	6

SEKSYEN H

Sejauhmanakah **rakan sekerja** anda memberikan pertolongan kepada anda apabila anda mempunyai masalah dalam kerja berdasarkan pernyataan-pernyataan di bawah? **Bulatkan** nombor dalam kotak yang paling tepat menggambarkan perasaan anda terhadap tahap bantuan yang anda terima daripada rakan sekerja berdasarkan skala berikut:

		Sepanjang masa					
		Sangat selalu					
		Selalu					
		Kadang-kadang					
		Jarang-jarang					
		Tidak pernah					
123	Maklumat atau nasihat yang membantu?	1	2	3	4	5	6
124	Memahami dengan rasa belas kasihan dan mengambil berat?	1	2	3	4	5	6
125	Maklumbalas yang jelas dan membantu?	1	2	3	4	5	6
126	Pertolongan yang praktikal?	1	2	3	4	5	6

SEKSYEN I

Sejauhmanakah **penyelia** anda menyediakan bantuan terhadap anda berdasarkan setiap pernyataan di bawah? **Bulatkan** nombor dalam kotak yang paling tepat menggambarkan perasaan anda terhadap tahap bantuan yang anda terima daripada penyelia anda berdasarkan skala berikut:

		Sepanjang masa					
		Sangat selalu					
		Selalu					
		Kadang-kadang					
		Jarang-jarang					
		Tidak pernah					
127	Maklumat atau nasihat yang membantu?	1	2	3	4	5	6
128	Memahami dengan rasa belas kasihan dan mengambil berat?	1	2	3	4	5	6
129	Maklumbalas yang jelas dan membantu?	1	2	3	4	5	6
130	Pertolongan yang praktikal?	1	2	3	4	5	6

Akhir sekali, sila lengkapkan maklumat tentang diri anda di bawah:

- (a) Umur: _____ tahun
- (b) Jantina (*sila bulatkan*): Perempuan / Lelaki
- (c) Status Perkahwinan (*sila bulatkan*):
Berkahwin

Duda/Janda

Bujang
- (d) Tahap Pendidikan tertinggi (*sila bulatkan*):
SPM/STPM

Diploma

Sarjana Muda

Sarjana

Lain-lain (nyatakan): _____
- (e) Jawatan sekarang (*sila bulatkan*):
Penolong Pegawai Teknikal

Juruteknik Kanan

Juruteknik

Lain-lain (nyatakan): _____
- (f) Status Perkhidmatan (*sila bulatkan*):
Tetap

Kontrak

Percubaan
- (g) Berapa lama anda berada dalam:
i) Jawatan anda sekarang? _____ tahun
ii) Syarikat anda sekarang? _____ tahun

Tarikh anda melengkapkan borang soal selidik ini: _____

Terima kasih kerana sudi melengkapkan borang soal selidik ini serta menjadi sebahagian daripada warga kajian saya. Saya amat menghargai masa dan usaha yang saudarali berikan bagi menjayakan kajian ini. Semoga dengan kerjasama yang saudarali berikan dapat menjana persekitaran kerja yang kondusif di masa hadapan.

Appendix C: Letter to Organisation

Department of Psychology Phone +64 7 856 2889
University of Waikato Fax +64 7 858 5132
Private Bag 3105
Hamilton
New Zealand



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

22 July 2006

Mrs Mariah Samad
Head of Human Resource Department
Level 4, Wisma TM
Jalan Sutera 3
Taman Sentosa
80150 Johor Bahru.

Assalamu'alaikum,

Madam,

Re: Permission to conduct a research at Telekom Malaysia

I am a PhD student at the Department of Psychology, University of Waikato, New Zealand. I am conducting a research on "The Impact of Work Design on Psychological Work Reactions and Employee Performance among Technical Workers". The major aim of my research is to investigate the impact of work design on psychological strain, job satisfaction, organisational commitment, turnover intentions, citizenship behaviours and in-role performance among technical workers. This research aims to explore the possibility of reducing the strain and its consequences among technical workers.

2. I selected your organisation to be the location of my research and the technical workers as the respondents. It is hoped that this research will assist your organisation to formulate a strategy in enhancing well-being and performance among technical workers.

3. Your cooperation in this study is highly appreciated.

Thank you.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Siti'.

SITI AISYAH PANATIK

Appendix D: Critical values of Chi Square (χ^2)

TABLE C.4 Critical Values of Chi Square (χ^2)

df	0.250	0.100	0.050	0.025	0.010	0.005	0.001
1	1.32330	2.70554	3.84146	5.02389	6.63490	7.87944	10.828
2	2.77259	4.60517	5.99147	7.37776	9.21034	10.5966	13.816
3	4.10835	6.25139	7.81473	9.34840	11.3449	12.8381	16.266
4	5.38527	7.77944	9.48773	11.1433	13.2767	14.8602	18.467
5	6.62568	9.23635	11.0705	12.8325	15.0863	16.7496	20.515
6	7.84080	10.6446	12.5916	14.4494	16.8119	18.5476	22.458
7	9.03715	12.0170	14.0671	16.0128	18.4753	20.2777	24.322
8	10.2188	13.3616	15.5073	17.5346	20.0902	21.9550	26.125
9	11.3887	14.6837	16.9190	19.0228	21.6660	23.5893	27.877
10	12.5489	15.9871	18.3070	20.4831	23.2093	25.1882	29.588
11	13.7007	17.2750	19.6751	21.9200	24.7250	26.7569	31.264
12	14.8454	18.5494	21.0261	23.3367	26.2170	28.2995	32.909
13	15.9839	19.8119	22.3621	24.7356	27.6883	29.8194	34.528
14	17.1770	21.0642	23.6848	26.1190	29.1413	31.3193	36.123
15	18.2451	22.3072	24.9958	27.4884	30.5779	32.8013	37.697
16	19.3688	23.5418	26.2962	28.8454	31.9999	34.2672	39.252
17	20.4887	24.7690	27.5871	30.1910	33.4087	35.7185	40.790
18	21.6049	25.9894	28.8693	31.5264	34.8053	37.1564	42.312
19	22.7178	27.2036	30.1435	32.8523	36.1908	38.5822	43.820
20	23.8277	28.4120	31.4104	34.1696	37.5662	39.9968	45.315
21	24.9348	29.6151	32.6705	35.4789	38.9321	41.4010	46.797
22	26.0393	30.8133	33.9244	36.7807	40.2894	42.7956	48.268
23	27.1413	32.0069	35.1725	38.0757	41.6384	44.1813	49.728
24	28.2412	33.1963	36.4151	39.3641	42.9798	45.5585	51.179
25	29.3389	34.3816	37.6525	40.6465	44.3141	46.9278	52.620
26	30.4345	35.5631	38.8852	41.9232	45.6417	48.2899	54.052
27	31.5284	36.7412	40.1133	43.1944	46.9630	49.6449	55.476
28	32.6205	37.9159	41.3372	44.4607	48.2782	50.9933	56.892
29	33.7109	39.0875	42.5569	45.7222	49.5879	52.3356	58.302
30	34.7998	40.2560	43.7729	46.9792	50.8922	53.6720	59.703
40	45.6160	51.8050	65.7585	59.3417	63.6907	66.7659	73.402
50	56.3336	63.1671	67.5048	71.4202	76.1539	79.4900	86.661
60	66.9814	74.3970	79.0819	83.2976	88.3794	91.9517	99.607
70	77.5766	85.5271	90.5312	95.0231	100.425	104.215	112.317
80	88.1303	96.5782	101.879	106.629	112.329	116.321	124.839
90	98.6499	107.565	113.145	118.136	124.116	128.299	137.208
100	109.141	118.498	124.342	129.561	135.807	140.169	149.449

Source: Adapted from Table 8 in *Biometrika Tables for Statisticians*, vol. 1, 3d ed., edited by E. S. Pearson and H. O. Hartley (New York: Cambridge University Press, 1958). Reproduced with the permission of the *Biometrika* trustees.

Appendix E. Standardised factor loadings for the one-factor model of job demands

Items	Time 1 (n=429)	Time 2 (n=245)
ad1← Job demands	0.46	0.45
ad2← Job demands	0.54	0.56
ad3← Job demands	0.64	0.49
ad4← Job demands	0.63	0.70
psd1← Job demands	0.54	0.69
psd2← Job demands	0.65	0.54
psd3← Job demands	0.64	0.66
psd4← Job demands	0.60	0.67
psd5← Job demands	0.62	0.37
rd1← Job demands	0.54	0.41
rd2← Job demands	0.50	0.36
rd3← Job demands	0.43	0.56
rd4← Job demands	0.50	0.55
rd5← Job demands	0.46	0.35
qd1← Job demands	0.59	0.46
qd2← Job demands	0.40	0.34
qd3← Job demands	0.54	0.46
qd4← Job demands	0.53	0.30
qd5← Job demands	0.48	0.30
qd7← Job demands	0.58	0.30
qd10← Job demands	0.47	0.30
qd11← Job demands	0.30	0.33

Appendix F. Standardised factor loadings for the final model of job control

Items	Time 1 (n = 429)	Time 2 (n = 245)
tc1←Timing control	0.62	0.51
tc2 ← Timing control	0.72	0.80
tc3← Timing control	0.67	0.80
tc4 ← Timing control	0.74	0.66
mc1 ←Methods control	0.58	0.53
mc2 ← Methods control	0.57	0.47
mc3 ← Methods control	0.65	0.77
mc4← Methods control	0.62	0.74
mc5← Methods control	0.73	0.61
mc6 ← Methods control	0.64	0.72
sd1← Skill discretion	0.53	0.64
sd2← Skill discretion	0.62	0.30
sd3 ← Skill discretion	0.72	0.78
sd4← Skill discretion	0.63	0.74
sd5← Skill discretion	0.64	0.74
sd6← Skill discretion	0.61	0.70
da1← Decision authority	0.88	0.76
da2← Decision authority	0.68	0.79
da3← Decision authority	0.83	0.70

Appendix G. Correlations between latent constructs of job control

Latent construct	Time 1	Time 2
TC↔MC	0.70	0.70
TC↔SD	0.49	0.51
TC↔DA	0.46	0.51
MC↔SD	0.54	0.42
MC↔DA	0.38	0.44
SD↔DA	0.57	0.49

Appendix H. Standardised factor loadings for the final model of social support

Items	Time 1 (n=429)	Time 2 (n=245)
SS1 ← SS	0.78	0.77
SS2 ← SS	0.87	0.79
SS3 ← SS	0.72	0.90
SS4 ← SS	0.89	0.75
CS1 ← CS	0.82	0.82
CS2 ← CS	0.78	0.89
CS3 ← CS	0.88	0.86
CS4 ← CS	0.88	0.83
POS1 ← POS	0.75	0.55
POS2 ← POS	0.73	0.68
POS4 ← POS	0.64	0.42
POS5 ← POS	0.74	0.67
POS7 ← POS	0.81	0.88
POS8 ← POS	0.79	0.83

Appendix I. Correlations between latent constructs of social support

Latent construct	Time 1	Time 2
SS ↔ CS	0.76	0.64
SS ↔ POS	0.56	0.45
CS ↔ POS	0.51	0.35

Appendix J. Standardized factor loadings for the final model of self-efficacy

Items	Time 1 (n = 429)	Time 2 (n = 245)
SE1← Self-efficacy	0.43	0.32
SE4← Self-efficacy	0.46	0.30
SE5← Self-efficacy	0.37	0.51
SE6← Self-efficacy	0.77	0.62
SE7← Self-efficacy	0.89	0.81
SE8← Self-efficacy	0.35	0.82
SE9← Self-efficacy	0.81	0.80
SE10← Self-efficacy	0.87	0.74

Appendix K. Standardised factor loadings of two-factor model of GHQ-12

Items	Time 1 (n=429)	Time 2 (n=245)
GHQ1<---Social dysfunction	0.53	0.30
GHQ2<---Anxiety/depression	0.66	0.65
GHQ3<---Social Dysfunction	0.71	0.45
GHQ4<---Social Dysfunction	0.64	0.36
GHQ5<---Anxiety/depression	0.75	0.60
GHQ6<---Anxiety/depression	0.83	0.77
GHQ7<---Social Dysfunction	0.55	0.71
GHQ8<---Social Dysfunction	0.59	0.79
GHQ9<---Anxiety/depression	0.73	0.82
GHQ10<---Anxiety/depression	0.60	0.92
GHQ11<---Anxiety/depression	0.44	0.86
GHQ12<---Social Dysfunction	0.59	0.55

Appendix L. Standardised factor loadings for the final model of job satisfaction

Items	Time 1 (n=429)	Time 2 (n=245)
JS1← Job satisfaction	0.60	0.38
JS2← Job satisfaction	0.65	0.55
JS3← Job satisfaction	0.48	0.43
JS4← Job satisfaction	0.64	0.71
JS5← Job satisfaction	0.62	0.53
JS6← Job satisfaction	0.70	0.72
JS7← Job satisfaction	0.63	0.71
JS8← Job satisfaction	0.74	0.74
JS9← Job satisfaction	0.76	0.74
JS10← Job satisfaction	0.70	0.63
JS11← Job satisfaction	0.74	0.74
JS12← Job satisfaction	0.70	0.73
JS13← Job satisfaction	0.64	0.46
JS14← Job satisfaction	0.66	0.56
JS15← Job satisfaction	0.75	0.59

Appendix M. Standardised factor loadings for one-factor model of affective commitment

Items	Time 1 (n=429)	Time 2 (n=245)
AC1←Affective commitment	0.37	0.35
AC3←Affective commitment	0.83	0.72
AC4←Affective commitment	0.50	0.42
AC5←Affective commitment	0.54	0.32
AC6←Affective commitment	0.67	0.93
AC7←Affective commitment	0.35	0.35
AC8←Affective commitment	0.70	0.71

Note. One-factor model of affective commitment with one item was deleted.

Appendix N. Standardised factor loadings for one-factor model of job performance

Items	Time 1 (n=429)	Time 2 (n=245)
IRP1	0.86	0.92
IRP2	0.62	0.68
IRP3	0.88	0.82
IRP4	0.80	0.85
IRP6	0.37	0.50
OCBO1	0.31	0.32
OCBO2	0.74	0.56
OCBO3	0.50	0.48
OCBO4	0.53	0.57
OCBO6	0.62	0.62
OCBO7	0.82	0.65
OCBI1	0.59	0.47
OCBI2	0.72	0.57
OCBI3	0.59	0.45
OCBI5	0.55	0.65
OCBI6	0.62	0.40
OCBI7	0.50	0.60

Appendix O. Reliability coefficient of the study variables

Variables	Time 1(n = 429)	Time 2 (n = 245)
	A	α
1. Job demands ^a	0.89	0.87
2. Timing control	0.74	0.77
3. Methods control	0.77	0.80
4. Skill discretion	0.80	0.78
5. Decision authority	0.80	0.80
6. Perceived organisational support	0.89	0.84
7. Supervisor support	0.89	0.88
8. Co-worker support	0.91	0.91
9. Self-efficacy	0.84	0.84
10. Anxiety/depression	0.84	0.89
11. Social dysfunction	0.84	0.74
12. Affective commitment	0.78	0.75
13. Job satisfaction	0.92	0.90
14. Turnover intentions	0.85	0.94
15. Job performance ^b	0.91	0.89

Note. Response scale for job demands, timing control and methods control ranged from 1 to 5; skill discretion and decision authority ranged from 1 to 6; perceived organisational support, self-efficacy, job satisfaction, affective commitment, turnover intentions, and job performance, ranged from 1 to 7; supervisor support and co-worker support, anxiety/depression, and social dysfunction ranged from 1 to 6; ^a a combination of attentions demands, problem-solving demands, responsibility demands, and quantitative demands; ^b a combination of in-role performance and organisational citizenship behaviour towards the organisation and organisational citizenship behaviour toward individuals.

Appendix P. Skewness and kurtosis of the study variables

Variables	Time 1 (n = 429)		Time 2 (n = 245)	
	Skew	Kurtosis	Skew	Kurtosis
1. Job demands	-0.25	-0.30	-0.15	-0.13
2. Timing control	-0.15	-0.65	-0.57	0.29
3. Methods control	-0.17	-0.59	-0.14	-0.59
4. Skill discretion	-0.44	-0.05	-0.66	0.03
5. Decision authority	-0.01	-0.78	-0.24	-0.53
6. POS	-0.58	-0.26	-0.35	0.41
7. Supervisor support	-0.66	-0.38	-0.24	-0.56
8. Co-worker support	-0.61	-0.25	-0.36	-0.33
9. Self-efficacy	0.47	-0.81	0.16	-0.81
10. Anxiety/depression	0.00	-0.84	0.37	-1.01
11. Social dysfunction	-0.75	0.76	-0.06	0.07
12. Affective commitment	0.12	-0.39	-0.19	-0.11
13. Job satisfaction	-0.93	0.15	-0.48	0.05
14. Global job satisfaction	-0.73	-0.01	-0.99	0.97
15. Turnover intentions	1.19	0.15	0.91	-0.63
16. Job performance	-0.59	-0.56	-0.45	-0.49

Note. Response scale for job demands, timing control, and methods control ranged from 1 to 5; skill discretion and decision authority ranged from 1 to 6; perceived organisational support, self-efficacy, job satisfaction, global job satisfaction, affective commitment, turnover intentions, and job performance ranged from 1 to 7; supervisor support and co-worker support, anxiety/depression, and social dysfunction ranged from 1 to 6.

S.E. for skewness at Time 1 = 0.118; S.E. for kurtosis at Time 1 = 0.235

S.E. for skewness at Time 2 = 0.156; S.E. for kurtosis at Time 2 = 0.310

Appendix Q. Means and Standard Deviations for Gender Differences between the study Variables at Time 1

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Mean_Demands	Female	66	3.5287	.53807	.06623
	Male	363	3.6239	.58145	.03052
Mean_TC	Female	66	3.8333	.73815	.09086
	Male	363	3.8285	.64320	.03376
Mean_MC	Female	66	4.0530	.52718	.06489
	Male	363	3.9752	.49754	.02611
Mean_SD	Female	66	4.8232	.60896	.07496
	Male	363	4.8930	.58628	.03077
Mean_DA	Female	66	4.3838	.71907	.08851
	Male	363	4.5051	.70747	.03713
Mean_POS	Female	66	5.1768	1.04672	.12884
	Male	363	5.3779	1.18413	.06215
Mean_SS	Female	66	4.2576	.93744	.11539
	Male	363	4.6598	.92891	.04875
Mean_CS	Female	66	4.5833	.90971	.11198
	Male	363	4.6674	.92131	.04836
Mean_socdys	Female	66	3.0556	.43885	.05402
	Male	363	3.2461	.45251	.02375
Mean_anxiety	Female	66	2.2778	.78137	.09618
	Male	363	2.6221	.80776	.04240
Mean_JS	Female	66	5.1424	.90445	.11133

	Male	363	5.4252	.88774	.04659
Mean_AC	Female	66	5.5693	.47907	.05897
	Male	363	5.5380	.48166	.02528
Mean_OJS	Female	66	5.2576	1.14099	.14045
	Male	363	5.7603	1.13233	.05943
Mean_TP	Female	66	5.9298	.89454	.11011
	Male	363	5.7506	.84615	.04441
Mean_OCBI	Female	66	5.7446	.97327	.11980
	Male	363	5.7682	.87875	.04612
Mean_TOI	Female	66	2.0101	1.26081	.15519
	Male	363	2.0487	1.47906	.07763
Mean_SE	Female	66	5.0152	1.19303	.14685
	Male	363	4.2293	1.15349	.06054

Appendix R. Means and Standard Deviations for Gender Differences between the study Variables at Time 2

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
mean_demands	Female	50	3.6645	.40900	.05784
	Male	195	3.5637	.56377	.04037
mean_TC	Female	50	3.9500	.43448	.06145
	Male	195	3.7897	.79058	.05661
mean_MC	Female	50	4.0600	.47828	.06764
	Male	195	3.9940	.58090	.04160
mean_SD	Female	50	4.6667	.69985	.09897
	Male	195	4.9735	.66236	.04743
mean_DA	Female	50	4.5333	.76783	.10859
	Male	195	4.4444	.83018	.05945
mean_POS	Female	50	5.1067	.59833	.08462
	Male	195	4.9923	.91714	.06568
mean_SS	Female	50	4.2050	.86998	.12303
	Male	195	4.3564	.98403	.07047
mean_CS	Female	50	4.6200	.71114	.10057
	Male	195	4.4859	.98774	.07073
mean_SE	Female	50	4.4550	1.21343	.17161
	Male	195	4.7821	1.11049	.07952
mean_socdys1	Female	50	3.0400	.45991	.06504
	Male	195	3.1137	.46932	.03361
mean_anxiety	Female	50	2.7767	1.01720	.14385

	Male	195	2.4761	.86735	.06211
mean_JS	Female	50	5.3387	.66132	.09352
	Male	195	5.3969	.83243	.05961
mean_OJS	Female	50	5.8000	.96890	.13702
	Male	195	5.8410	1.11242	.07966
mean_AC	Female	50	5.0943	.99504	.14072
	Male	195	5.3861	.98510	.07054
mean_TP	Female	50	5.4673	.93885	.13277
	Male	195	5.8392	.82901	.05937
mean_OCBI	Female	50	5.5971	.57773	.08170
	Male	195	5.6996	.84999	.06087
mean_TOI	Female	50	3.1133	2.17240	.30722
	Male	195	2.3607	1.71188	.12259

Appendix S: Simple slope test for job demands (X) x timing control (Z) x social support (W) on social dysfunction

THREE-WAY INTERACTION SIMPLE SLOPES OUTPUT

Your Input

X1 = 1
X2 = 5
Z1 = 4.8
Z2 = 2.8
W1 = 5.6
W2 = 3.6
Intercept = 3.55
X Slope = 0.05
Z Slope = 0.043
W Slope = 0.048
XZ Slope = -0.009
XW Slope = 0.077
ZW Slope = 0.025
XZW Slope = -0.118
df = 416
alpha = 0.05

Asymptotic (Co)variances

var(b0) = 0.04350443
var(b1) = 0.00237578
var(b2) = 0.00186077
var(b3) = 0.00074179
var(b4) = 0.00059335
var(b5) = 0.00080003
var(b6) = 0.00082193
var(b7) = 0.00047274
cov(b4,b1) = -0.00001965
cov(b5,b1) = -0.00001516
cov(b7,b1) = 0.00008958
cov(b5,b4) = 0.00004123
cov(b7,b4) = 0.00003139
cov(b7,b5) = -0.00001975
cov(b2,b0) = -0.00171378
cov(b3,b0) = -0.00284943
cov(b6,b0) = -0.00007019
cov(b3,b2) = 0.00006079
cov(b6,b2) = 0.00023011
cov(b6,b3) = -0.0000231

Regions of Significance

Z at lower bound of region for W1 = 0.2261
Z at upper bound of region for W1 = 1.4384
(simple slopes are significant *outside* this region.)

Z at lower bound of region for W2 = 0.2354
Z at upper bound of region for W2 = 1.5334
(simple slopes are significant *outside* this region.)

Simple Intercepts and Slopes at Conditional Values of Z and W

At W1 and Z1...

simple intercept = 4.6972(0.8409), t=5.5861, p=0
simple slope = -2.7338(0.6257), t=-4.3691, p=0

At W1 and Z2...

simple intercept = 4.3312(0.5077), t=8.5307, p=0
simple slope = -1.3942(0.3892), t=-3.5826, p=0.0004

At W2 and Z1...

simple intercept = 4.3612(0.5826), t=7.4858, p=0
simple slope = -1.755(0.4178), t=-4.2008, p=0

At W2 and Z2...

simple intercept = 4.0952(0.3636), t=11.2619, p=0
simple slope = -0.8874(0.2611), t=-3.3985, p=0.0007

Simple Intercepts and Slopes at Region Boundaries

At Lower Bound for W1...

simple intercept = 3.8602(0.1878), t=20.5539, p=0
simple slope = 0.3298(0.1678), t=1.9657, p=0.05

At Upper Bound for W1...

simple intercept = 4.082(0.3003), t=13.5915, p=0
simple slope = -0.4823(0.2453), t=-1.9657, p=0.05

At Lower Bound for W2...

simple intercept = 3.7541(0.1801), t=20.8486, p=0
simple slope = 0.2251(0.1145), t=1.9657, p=0.05

At Upper Bound for W2...

simple intercept = 3.9267(0.2442), t=16.0788, p=0
simple slope = -0.338(0.172), t=-1.9657, p=0.05

Appendix T: Simple slope test for job demands (X) x decision authority (Z) x social support (W) on social dysfunction

THREE-WAY INTERACTION SIMPLE SLOPES OUTPUT

Your Input

=====

X1	= 1
X2	= 5
Z1	= 5.5
Z2	= 3.5
W1	= 5.6
W2	= 3.6
Intercept	= 3.55
X Slope	= 0.05
Z Slope	= -0.02
W Slope	= 0.048
XZ Slope	= 0.075
XW Slope	= 0.077
ZW Slope	= 0.028
XZW Slope	= 0.112
df	= 416
alpha	= 0.05

Asymptotic (Co)variances

=====

var(b0)	= 0.04350443
var(b1)	= 0.00237578
var(b2)	= 0.00112241
var(b3)	= 0.00074179
var(b4)	= 0.00058811
var(b5)	= 0.00080003
var(b6)	= 0.00052162
var(b7)	= 0.00048183
cov(b4,b1)	= 0.0001991
cov(b5,b1)	= -0.00001516
cov(b7,b1)	= -0.0002241
cov(b5,b4)	= -0.00005424
cov(b7,b4)	= -0.0000639
cov(b7,b5)	= 0.00010166
cov(b2,b0)	= -0.00240317
cov(b3,b0)	= -0.00284943
cov(b6,b0)	= -0.00007819
cov(b3,b2)	= -0.00015043
cov(b6,b2)	= 0.00005105
cov(b6,b3)	= -0.00001677

Regions of Significance

Z at lower bound of region for W1 = -1.297
Z at upper bound of region for W1 = -0.2234
(simple slopes are significant *outside* this region.)

Z at lower bound of region for W2 = -1.2935
Z at upper bound of region for W2 = -0.2207
(simple slopes are significant *outside* this region.)

Simple Intercepts and Slopes at Conditional Values of Z and W

At W1 and Z1...

simple intercept = 4.5712(0.7312), t=6.2518, p=0
simple slope = 4.3433(0.7076), t=6.1385, p=0

At W1 and Z2...

simple intercept = 4.2976(0.4759), t=9.0295, p=0
simple slope = 2.9389(0.4729), t=6.2147, p=0

At W2 and Z1...

simple intercept = 4.1672(0.4943), t=8.4312, p=0
simple slope = 2.9573(0.4594), t=6.437, p=0

At W2 and Z2...

simple intercept = 4.0056(0.331), t=12.1014, p=0
simple slope = 2.0009(0.3071), t=6.5158, p=0.0007

Simple Intercepts and Slopes at Region Boundaries

At Lower Bound for W1...

simple intercept = 3.6414(0.2759), t=13.1964, p=0
simple slope = -0.4296(0.2185), t=-1.9657, p=0.05

At Upper Bound for W1...

simple intercept = 3.7882(0.194), t=19.5274, p=0
simple slope = 0.3243(0.165), t=1.9657, p=0.05

At Lower Bound for W2...

simple intercept = 3.6183(0.2352), t=15.3847, p=0
simple slope = -0.2913(0.1482), t=-1.9657, p=0.05

At Upper Bound for W2...

simple intercept = 3.705(0.1858), t=19.9401, p=0
simple slope = 0.2217(0.1128), t=1.9657, p=0.05

Appendix U: Path coefficient for the modified overall model at Time 1

Unstandardized Regression Weights

			Estimate	S.E.	C.R.
Anxiety/depression	<---	Job demands	.664**	.078	8.508
Anxiety/depression	<---	Timing control	.052	.082	.642
Anxiety/depression	<---	Methods control	-.541**	.100	-5.402
Anxiety/depression	<---	Skill discretion	-.229**	.071	-3.221
Anxiety/depression	<---	Decision authority	-.016	.058	-.277
Social dysfunction	<---	Job demands	.030	.048	.625
Social dysfunction	<---	Timing control	.050	.050	1.003
Social dysfunction	<---	Methods control	-.187**	.061	-3.038
Social dysfunction	<---	Skill discretion	-.048	.044	-1.090
Social dysfunction	<---	Decision authority	-.041	.036	-1.137
Job satisfaction	<---	Anxiety/depression	-.044	.049	-.888
Affective commitment	<---	Anxiety/depression	-.131**	.025	-5.329
Turnover intentions	<---	Anxiety/depression	.659**	.081	8.086
Job satisfaction	<---	Social dysfunction	-.304**	.088	-3.472
Affective commitment	<---	Social dysfunction	-.230**	.044	-5.283
Turnover intentions	<---	Social dysfunction	.014	.145	.098
Affective commitment	<---	Skill discretion	.298**	.032	9.254
Job satisfaction	<---	Decision authority	.223**	.060	3.734
Job satisfaction	<---	Skill discretion	.386**	.073	5.262
Job performance	<---	Job satisfaction	.075*	.033	2.262
Job performance	<---	Affective commitment	.521**	.068	7.646
Job performance	<---	Turnover intentions	-.062*	.020	-3.054
Job performance	<---	Social dysfunction	-.234**	.061	-3.810
Job performance	<---	Anxiety/depression	-.129**	.039	-3.320
Job performance	<---	Skill discretion	.432**	.055	7.857
Job performance	<---	Job demands	-.345**	.058	-5.972
Job performance	<---	Methods control	.284**	.066	4.278

Note. **p < 0.01; *p < 0.05

Standardized Regression Weights

			Estimate
Anxiety/depression	<---	Job demands	.470
Anxiety/depression	<---	Timing control	.042
Anxiety/depression	<---	Methods control	-.334
Anxiety/depression	<---	Skill discretion	-.166
Anxiety/depression	<---	Decision authority	-.014
Social dysfunction	<---	Job demands	.038
Social dysfunction	<---	Timing control	.073
Social dysfunction	<---	Methods control	-.206
Social dysfunction	<---	Skill discretion	-.062
Social dysfunction	<---	Decision authority	-.063
Job satisfaction	<---	Anxiety/depression	-.040
Affective commitment	<---	Anxiety/depression	-.222
Turnover intentions	<---	Anxiety/depression	.370
Job satisfaction	<---	Social dysfunction	-.155
Affective commitment	<---	Social dysfunction	-.219
Turnover intentions	<---	Social dysfunction	.004
Affective commitment	<---	Skill discretion	.367
Job satisfaction	<---	Decision authority	.177
Job satisfaction	<---	Skill discretion	.255
Job performance	<---	Job satisfaction	.081
Job performance	<---	Affective commitment	.301
Job performance	<---	Turnover intentions	-.109
Job performance	<---	Social dysfunction	-.129
Job performance	<---	Anxiety/depression	-.127
Job performance	<---	Skill discretion	.308
Job performance	<---	Job demands	-.240
Job performance	<---	Methods control	.173

Appendix V. Path coefficient for the modified overall model at Time 2

Unstandardized Regression Weights			Estimate	S.E.	C.R.
Anxiety/depression	<---	Job demands	.606**	.133	4.544
Anxiety/depression	<---	Decision authority	.050	.081	.614
Anxiety/depression	<---	Methods control	-.304*	.132	-2.309
Anxiety/depression	<---	Skill discretion	-.195*	.094	-2.066
Social dysfunction	<---	Methods control	-.160*	.066	-2.428
Social dysfunction	<---	Timing control	-.004	.051	-.072
Social dysfunction	<---	Skill discretion	-.091*	.047	-1.933
Social dysfunction	<---	Decision authority	-.060	.041	-1.490
Anxiety/depression	<---	Timing control	.025	.102	.240
Social dysfunction	<---	Job demands	-.070	.067	-1.047
Turnover intentions	<---	Social dysfunction	-.149	.198	-.751
Job satisfaction	<---	Anxiety/depression	-.093	.053	-1.758
Turnover intentions	<---	Anxiety/depression	1.236**	.098	12.560
Turnover intentions	<---	Skill discretion	-.730**	.133	-5.479
Affective commitment	<---	Social dysfunction	.019	.118	.158
Job satisfaction	<---	Social dysfunction	-.124	.108	-1.155
Affective commitment	<---	Anxiety/depression	-.505**	.059	-8.612
Job satisfaction	<---	Decision authority	.254**	.064	3.968
Job satisfaction	<---	Skill discretion	.226**	.078	2.917
Affective commitment	<---	Skill discretion	.471**	.079	5.928
Job performance	<---	Job satisfaction	.069	.042	1.650
Job performance	<---	Affective commitment	.089*	.043	2.080
Job performance	<---	Turnover intentions	-.101**	.026	-3.951
Job performance	<---	Anxiety/depression	-.246**	.047	-5.252
Job performance	<---	Social dysfunction	.010	.073	.141
Job performance	<---	Skill discretion	.369**	.055	6.750
Job performance	<---	Job demands	.172*	.066	2.591

Note. ** p < 0.01; * p < 0.05

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Anxiety/depression	<---	Job demands	.359
Anxiety/depression	<---	Decision authority	.045
Anxiety/depression	<---	Methods control	-.188
Anxiety/depression	<---	Skill discretion	-.146
Social dysfunction	<---	Methods control	-.193
Social dysfunction	<---	Timing control	-.006
Social dysfunction	<---	Skill discretion	-.133
Social dysfunction	<---	Decision authority	-.106
Anxiety/depression	<---	Timing control	.020
Social dysfunction	<---	Job demands	-.080
Turnover intentions	<---	Social dysfunction	-.038
Job satisfaction	<---	Anxiety/depression	-.105
Turnover intentions	<---	Anxiety/depression	.610
Turnover intentions	<---	Skill discretion	-.270
Affective commitment	<---	Social dysfunction	.009
Job satisfaction	<---	Social dysfunction	-.072
Affective commitment	<---	Anxiety/depression	-.461
Job satisfaction	<---	Decision authority	.258
Job satisfaction	<---	Skill discretion	.191
Affective commitment	<---	Skill discretion	.323
Job performance	<---	Job satisfaction	.074
Job performance	<---	Affective commitment	.117
Job performance	<---	Turnover intentions	-.247
Job performance	<---	Anxiety/depression	-.297
Job performance	<---	Social dysfunction	.006
Job performance	<---	Skill discretion	.334
Job performance	<---	Job demands	.123

Appendix W: Path coefficient for the longitudinal modified overall model

Unstandardized Regression Weights

			Estimate	S.E.	C.R.
T2 Social dysfunction	<---	T1 Job demands	.040	.064	.623
T2 Social dysfunction	<---	T1 Decision authority	-.025	.048	-.515
T2 Anxiety/depression	<---	T1 Skill discretion	.055	.108	.505
T2 Anxiety/depression	<---	T1 Methods control	.421**	.146	2.880
T2 Anxiety/depression	<---	T1 Timing control	-.457**	.114	-4.008
T2 Anxiety/depression	<---	T1 Job demands	-.017	.123	-.139
T2 Social dysfunction	<---	T1 Social dysfunction	-.018	.064	-.285
T2 Social dysfunction	<---	T1 Timing control	-.086	.064	-1.333
T2 Social dysfunction	<---	T1 Methods control	.006	.080	.078
T2 Anxiety/depression	<---	T1 Decision authority	-.025	.085	-.294
T2 Anxiety/depression	<---	T1 Anxiety/depression	.396**	.070	5.672
T2 Social dysfunction	<---	T1 Skill discretion	.036	.060	.597
T2 Affective commitment	<---	T2 Social dysfunction	-.172	.121	-1.417
T2 Turnover intentions	<---	T2 Social dysfunction	.132	.200	.660
T2 Affective commitment	<---	T2 Anxiety/depression	-.507**	.063	-8.020
T2 Job satisfaction	<---	T1 Job satisfaction	.126*	.052	2.437
T2 Affective commitment	<---	T1 Affective commitment	-.016	.095	-.166
T2 Turnover intentions	<---	T2 Anxiety/depression	1.210**	.104	11.620
T2 Job satisfaction	<---	T2 Anxiety/depression	-.039	.056	-.704
T2 Job satisfaction	<---	T2 Social dysfunction	-.376**	.107	-3.498
T2 Turnover intentions	<---	T1 Turnover intentions	.064	.054	1.185
T2 Job performance	<---	T2 Affective commitment	.160**	.047	3.437
T2 Job performance	<---	T2 Turnover intentions	-.122**	.028	-4.324
T2 Job performance	<---	T1 Job performance	.057	.040	1.431
T2 Job performance	<---	T2 Social dysfunction	-.164*	.078	-2.100
T2 Job performance	<---	T2 Anxiety/depression	-.133**	.050	-2.656
T2 Job performance	<---	T2 Job satisfaction	.146**	.045	3.253

Note. ** p < 0.01; *p < 0.05

Standardized Regression Weights

			Estimate
T2 Social dysfunction	<---	T1 Job demands	.051
T2 Social dysfunction	<---	T1 Decision authority	-.039
T2 Anxiety/depression	<---	T1 Skill discretion	.037
T2 Anxiety/depression	<---	T1 Methods control	.247
T2 Anxiety/depression	<---	T1 Timing control	-.363
T2 Anxiety/depression	<---	T1 Job demands	-.011
T2 Social dysfunction	<---	T1 Social dysfunction	-.018
T2 Social dysfunction	<---	T1 Timing control	-.132
T2 Social dysfunction	<---	T1 Methods control	.007
T2 Anxiety/depression	<---	T1 Decision authority	-.020
T2 Anxiety/depression	<---	T1 Anxiety/depression	.372
T2 Social dysfunction	<---	T1 Skill discretion	.047
T2 Affective commitment	<---	T2 Social dysfunction	-.081
T2 Turnover intentions	<---	T2 Social dysfunction	.034
T2 Affective commitment	<---	T2 Anxiety/depression	-.462
T2 Job satisfaction	<---	T1 Job satisfaction	.150
T2 Affective commitment	<---	T1 Affective commitment	-.008
T2 Turnover intentions	<---	T2 Anxiety/depression	.600
T2 Job satisfaction	<---	T2 Anxiety/depression	-.044
T2 Job satisfaction	<---	T2 Social dysfunction	-.219
T2 Turnover intentions	<---	T1 Turnover intentions	.053
T2 Job performance	<---	T2 Affective commitment	.217
T2 Job performance	<---	T2 Turnover intentions	-.303
T2 Job performance	<---	T1 Job performance	.069
T2 Job performance	<---	T2 Social dysfunction	-.105
T2 Job performance	<---	T2 Anxiety/depression	-.164
T2 Job performance	<---	T2 Job satisfaction	.160