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THE MEDIATING EFFECTS OF PERCEIVED JOB
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THE EFFECT OF COWORKER SUPPORT ON A WORKER'S STRESS:
THE MEDIATING EFFECTS OF PERCEIVED JOB CHARACTERISTICS

By

Kyoko Kato

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ABSTRACT

THE EFFECT OF COWORKER SUPPORT ON A WORKER'S STRESS:
THE MEDIATING EFFECTS OF PERCEIVED JOB CHARACTERISTICS

By

Kyoko Kato

Increased demands on workers due to competitive pressures have resulted in high

levels of workplace stress (Green, 2001; Hoel, Sparks, & Cooper, 2002; Landsbergis,

Cahill, & Schnall, 1999; NIOSH, 1999) . This can cause work-family conflict, stress-

related illness, and absenteeism, resulting in reduced productivity, organizational

performance and competitiveness, as well as increased costs for compensation and legal

challenges (Thomas & Ganster, 1995; Wells, 1982). Social support from the work

environment has been considered one of the critical resources that can reduce the

negative effect of workplace stressors; however research has failed to identify the

mechanism through which this occurs (Carlson & Perrewe, 1999). The purpose of this

dissertation is therefore to begin to explain how social support, more specifically

coworker support, influences an individual's stress level by introducing perceived job

characteristics as mediators.

The proposed model considers perceptions of job characteristics as socially

constructed through coworker support; these perceptions, in turn, become critical

determinants of an individual's stress. This dissertation explores the possible antecedents

of coworker support, that is, demographic similarity in terms of age, gender, and ethnic

background. It is assumed that such similarity increases a coworker's sense of

identification and elicits more cooperative behavior. The proposed model is developed

based on an integration of two seminal theories: the Social Information Processing (SIP)

approach developed by Salancik and Pfeffer (1978) and the Demand-Control model of job characteristics developed by Karasek (1979).

Using nationally representative data collected by the Families and Work Institute, this dissertation examines the mediating effect of perceived job characteristics, predicting that the direct effect of coworker support on stress is supplemented by effects of individuals' perceptions of two job characteristics: job demands and job control.

The empirical results generally support the notion that job characteristics play a mediating role for the relationship between coworker support and stress, but they did not confirm a good theoretical fit of the proposed model. Recommendations for future research, theoretical contributions, practical implications, and overall conclusions are discussed.

To my husband and parents

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CHAPTER 1: INTRODUCTION

According to a report by the International Labour Organization (ILO),

approximately 30 percent of the workforce in developed countries suffer from work

related stress, and the figure appears to be increasing (Hoel, Sparks, & Cooper, 2002).

This increase of stress in the workplace can be attributed to rapid changes in the current

work environment, such as the increase of global competition, the introduction of new

forms of work organization, and changes in the demographic composition of the

workforce (Barker, 1993; Kirkman & Rosen, 1999; Liden, Wayne, & Bradway, 1997;

NIOSH, 2002). Global competition has contributed to downsizing and restructuring,

which increases pressures on people at work (Hoel et al., 2002). High performance

workplaces are associated with more worker discretion and involvement in decision

making (Appelbaum, Bailey, Berg, & Kalleberg, 2000), as this work environment tends

to result in work intensification (Francis Green, 2001, 2002; F. Green & McIntosh, 2001;

Landsbergis, Cahill, & Schnall, 1999; NIOSH, 1999; C. S. Smith, Tisak, Hahn, &

Schmieder, 1997; Zeytinoglu, Denton, Davies, Baumann, & Boos, 2007). In addition,

demographic changes within the workforce, such as increases in female participation,

immigrant workers and non-standard work arrangements, also heighten the vulnerability

of particular workers.

Previous research has indicated that stress is associated with negative

consequences for individuals, such as (1) the quality of the working experience (e.g., job

satisfaction, self-esteem, and commitment), (2) general well-being (e.g., life satisfaction

and happiness), (3) physical health outcomes (e.g., heart disease), and (4) problematic

behavior (e.g., alcoholism and drug abuse) (Cary L. Cooper, Dewe, & O'Driscoll, 2001;

Wells, 1982). Research also shows that having highly stressed workers can be costly for organizations, since these stressed workers are more likely to be involved in legal challenges and compensation for stress-related illness and accidents (L. T. Thomas & Ganster, 1995). Due to such negative outcomes for both individual workers and their organizations, investigating the factors that affect the level of an individual's stress is an important area of stress research.

Social support has emerged as one of the critical resources that can affect individuals' stress levels (Dawn S Carlson & Perrewe, 1999; L. T. Thomas & Ganster, 1995). Since the 1980s, a substantial amount of research on the beneficial effects of social support has appeared in the social science literature (Ducharme & Martin, 2000; House, 1981b; Kaufmann & Beehr, 1986; Parasuraman, Greenhaus, & Granrose, 1992). Social support is conceptualized as a flow of communication between people involving emotional concern, caring, and informational/instrumental help (Daniels & Guppy, 1994; Seers, McGee, Serey, & Graen, 1983). This theoretical concept rests on the assertion that social relations in the workplace may make a key contribution to employees' job satisfaction, productivity, and well-being (Dawn S. Carlson, 1999; Ducharme & Martin, 2000).

A number of recent studies have investigated the relationship between a supportive social environment and stress (Terry A. Beehr, Jex, Stacy, & Murray, 2000; Dawn S. Carlson, Kacmar, & Williams, 2000; Ducharme & Martin, 2000; Parasuraman et al., 1992; Searle, Bright, & Bochner, 2001). Researchers have suggested that there are two dominant hypotheses that describe the effect of social support (Cohen & Wills, 1985; Daniels & Guppy, 1994; Jex, 1998). The first hypothesis, called a direct/main effect of

social support on the outcome, proposes that a high level of social support may directly reduce levels of stress (Jex, 1998). The second hypothesis, known as the moderating/buffering hypothesis, suggests that social support interacts with stressors such that social support moderates/buffers the effect of stressors upon the outcomes. In other words, the moderating/buffering hypothesis proposes that the strength of the relationship between stressors and the outcomes depends on the level of social support. It means that when social support is high, the relationship between stressors and their outcomes is relatively weak. In contrast, if social support is low, the relationship between stressors and their outcomes becomes stronger.

While many studies have found a significant direct effect of social support on various outcomes including stress, there is considerable debate and dispute over the moderating/buffering effect of social support given inconsistent empirical findings of such an effect (Parasuraman et al., 1992; Yang & Carayon, 1995; Carlson & Perrewe, 1999). In fact, many studies have been plagued by methodological problems such as measurement unreliability and low statistical power (Cohen & Wills, 1985; Ganster et al., 1986; Beehr et al., 2000). A more conceptual problem is, however, the lack of theoretical underpinnings for the moderating/buffering effect of social support. A theoretical rationale that explains the effect of social support on a stressor-stress relationship remains an unanswered question (Carlson & Perrewe, 1999). Researchers have suggested that discussions of the direct and moderating/buffering effects of social support are often empirically-driven and their hypotheses are theoretically weak in explaining the relationship of social support to its outcomes (Cary L. Cooper et al., 2001).

Instead of using a moderating/buffering hypothesis of social support, this dissertation proposes a different mechanism; it explains the relationship of social support to an individual's stress by introducing perceived job characteristics as mediators. In other words, this dissertation tests the model shown in Figure 1 below, in which the effect of social support on stress is mediated by the effect of an individual's perceptions of two job characteristics: job demands and job control. Job demands are referred to as the amount of workload that individuals perceive regarding their job (Robert A Karasek, 1979). Job control, on the other hand, represents the potential control that workers have over their tasks during a working day (Karasek, 1979). In this proposed model, job control consists of two dimensions: autonomy and skill discretion. Autonomy is the authority that workers possess to make decisions on the job, and skill discretion is the breadth of skills used by the worker on the job (R. Karasek & Theorell, 1990).
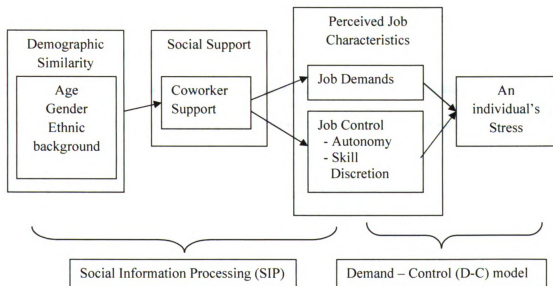
Figure 1: The Proposed Model

The uniqueness of the proposed model can be described in two ways. First, rather than seeing social support as a moderator/buffer for the relationship between stressor and stress, the proposed model considers social support as an antecedent that affects the level of stressors, which are job characteristics in this model. Second, rather than emphasizing individuals' predispositions, the model focuses on social construction of information that may determine individuals' perceptions of job characteristics. In short, the model proposes that such perceptions are constructed by social cues, such as social support, which individuals receive from their work environment. The perceived job characteristics in turn affect the level of an individual's stress.

As shown in the figure above, the notion that an individual's perception is socially constructed comes from the Social Information Processing (SIP) approach developed by Salancik and Pfeffer (1978); this approach suggests that individuals' perceptions are influenced by the social environment or by the network of social and informational relationships. The theoretical relationship between perceived job characteristics and an individual's stress, on the other hand, is explained by Karasek's (1979) Demand-Control (D-C) model of job characteristics. By integrating two well-developed and well-tested theories, this dissertation provides a theoretical foundation for examining the impact of social support on an individual's stress.

Social support studies have been dominated by the examination of supervisor support, but they have paid far less attention to the potential effect of another type of social support in the workplace, namely coworker support (Ducharme & Martin, 2000). As articulated in Figure 1, this dissertation focuses only on coworker support. The significance of coworkers' influence on individuals, due especially to the frequency of

interactions, has been continuously increasing because of the globalization of business,

the introduction of new work practices, and demographic changes of the workforce,

(Barker, 1993; Kirkman & Rosen, 1999; Liden et al., 1997). For instance, the

globalization of business requires flatter organizational structures for the purpose of

flexibility; in such workplaces, employees are frequently asked to cooperate with their

colleagues across boundaries, such as functional areas and divisions, to secure

cooperation from individuals over whom they have no hierarchical control (M. Williams,

2001).

In addition, the introduction of a self-directed team places more collective

responsibilities on individual workers for the processes and outcomes of their work,

including situations where scheduling and production goals are determined by consensus

among team members (Parker, Wall, & Cordery, 2001). Such team-based work requires

more interaction among coworkers than supervisors in order to coordinate tasks smoothly.

Furthermore, workforce diversity, due to changes in the labor force such as the

change of family composition (e.g., single parents), the increase of minorities and

females in the labor force, and an aging society, represents a great challenge for workers

(Hodson, 2005). For example, they have to make an extra effort to communicate with

others to fill the gap between cultural/ethnic backgrounds and generations. In addition,

many organizations use non-standard employment arrangements (e.g., hiring part-time,

temporary, and contract workers) to cope with environmental turbulence (Ang, Van Dyne,

& Begley, 2003; Davis-Blake, Broschak, & George, 2003; Kalleberg, Reskin, & Hudson,

2000). The use of non-standard workers has created a blended workforce, where workers

in both standard and non-standard arrangements work side-by-side doing the same tasks,

sometimes even on the same work teams (Davis-Blake et al., 2003; Pearce, 1993; Rogers, 2000; V. Smith, 2001). Under these circumstances, more frequent communication across diverse work groups is necessary for cooperative work (Hodson, 2005).

If workers are required to interact more with their coworkers, such interactions play a significant role in affecting their psychological and physical states. In this regard, positive interactions, such as social support from coworkers, become a critical issue in the workplace. Investigating the effect of coworkers is therefore an increasingly important component of workplace studies (Hodson, 2005). This dissertation differentiates coworker support from that of supervisors in order to articulate their specific effects on an individual's stress level.

In addition, this dissertation explores a possible antecedent of social support: demographic similarity (see Figure 1 above). Demographic similarity in this model refers to similarity in age, gender, and ethnic background of coworkers. Previous studies have found that demographic similarity has a significant effect on the level of social support by increasing workers' sense of identification and by eliciting more cooperative behavior (Hodson, 2005). In short, this dissertation not only focuses on the relationship among coworker support, job characteristics, and stress, but also focuses on the relationship of coworker support with its antecedent, demographic similarity. Identifying an antecedent of social support may strengthen the theoretical implications of the proposed model.

This dissertation uses the 2002 National Study of Changing Workforce (NSCW), a survey conducted by the Families and Work Institute. This data set consists of a representative sample of 3,500 employed adults. Using the method suggested by Baron

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and Kenny (1986), this dissertation primarily examines the mediating effect of job characteristics on the relationship between coworker support and an individual's stress level. In addition, Structural Equation Modeling (SEM) is used to investigate the theoretical fit of the proposed model, including demographic similarity, coworker support, job characteristics and stress.

This dissertation has several conceptual and methodological strengths. First, this dissertation attempts to explain 'how' and 'why' social support, more specifically coworker support, reduces individuals' stress levels, which has not yet been explained (Carlson & Perrewe, 1999). By introducing job characteristics as mediators, the linkage between social support and stress can be explained by two existing theories: the Social Information Processing approach and the Demand-Control model. The integration of these two theories may provide a solution for the debate over the effect of social support on various psychological outcomes.

Second, this dissertation challenges some criticisms of job characteristics studies that have failed to take into account factors that constrain individuals' perception of job characteristics (Cappelli & Sherer, 1991; Clegg, 1984; Morgeson & Campion, 2003; Parker et al., 2001). By introducing social support as a contextual influence, this dissertation proposes that individuals' perception of job characteristics is socially constructed by such influence. Although research interest in job characteristics appears to have declining in recent years, this dissertation revitalizes job characteristics research by broadening the job design/characteristics paradigm (Morgeson & Campion, 2003).

Third, this dissertation provides practical implications, especially for coworker relationships in a workplace. For example, empirical findings from this dissertation may

support organizational attempts to promote worker integration on a social level, such as company-sponsored parties and other social activities. Such activities may be even more beneficial when combined with efforts aimed at building effective work teams that enhance workers' opportunities to provide on-the-job assistance, advice, and information to their coworkers (Ducharme & Martin, 2000). Furthermore, arranging a structure/system in the workplace that promotes interactions among coworkers may facilitate workers' access to positive aspects of practical support. Such a system may be particularly beneficial in a team setting when work demands exceed individuals' abilities to fulfill their job requirements. In other words, these systematic efforts to promote both instrumental and affective networks among coworkers will enhance workers' affect and may consequently improve job performance.

This dissertation provides another critical implication. Traditionally, studies of job characteristics have been analyzed using the 'need-satisfaction paradigm,' which emphasizes individuals' predispositions for explaining the effect of job characteristics (Morgeson & Campion, 2003). Consequently, these studies have looked to potentially expensive and time-consuming practices such as job enlargement or enrichment and improve an individual's perception of job characteristics (Piccolo & Colquitt, 2006). However, the proposed model suggests that, in addition to predispositions, social construction of information provided by coworkers could also determine perceptions of job characteristics (R. W. Griffin, Bateman, Wayne, & Head, 1987; Piccolo & Colquitt, 2006). Job design, therefore, could be improved by attending to the demographic composition of work environments (e.g., age, gender, and ethnicity), training for

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interpersonal skills, or promoting a cultural change within an organization (Parker et al., 2001).

A final advantage of this dissertation is that it uses a large and nationally representative dataset; this may resolve a critical issue commonly identified in both social support and job characteristics studies, namely, the issue of inconsistent findings (D. Ganster, M. R. Fusilier, & B. T. Mayes, 1986). Previous studies generally agree that inconsistent findings result from confounding factors such as size and heterogeneity of samples, socioeconomic status, health-related behavior, individual differences (e.g., age, sex and constitution), and duration of exposure (de Jonge & Kompier, 1997; de Jonge, van Breukelen, Landeweerd, & Nijhuis, 1999; de Rijk, Le Blanc, Schaufeli, & de Jonge, 1998; van der Doef & Maes, 1999). The dataset used for this dissertation is large enough to provide statistically powerful tests of models of social support and job characteristics.

This dissertation will proceed as follows. Chapter 2 reviews previous research and studies in detail to develop a theoretical model. Chapter 3 discusses the proposed model, and descrbes the hypotheses tested in Chapter 4. The research method, including a discussion of the sample, scales, and analytical strategies, is covered in Chapter 5. Chapter 6 discusses the analyses and results, and Chapter 7 concludes this dissertation with a discussion of the major findings and their implications for research and practice. Discussions of study limitations, suggestions for future research, and the primary contributions of this dissertation are also included in Chapter 7.

CHAPTER 2: LITERATURE REVIEW

<u>Stress</u>

When describing stress, researchers often break down the concept of stress into two components: stressors and strains. Stressors are external events or conditions, such as excessive noise and temperature in the workplace and high and repetitive task demands, which require adaptive response from individuals (Goldberger & Breznitz, 1993; Jex, 1998). The National Institute of Occupational Safety and Health (NIOSH) has identified several important psychological risk factors in the workplace (Jex, 1998): workload and work pace, work schedule, role stressors, career security factors, interpersonal factors, and job content (characteristics). Stress researchers have also paid special attention to such factors. In a more recent study, Cooper et al. (2001) added 'work-home interface' as an emerging stressor to the above work-related factors.

Workload is one of the most significant and salient stressors consistently discussed in stress research. Workload is the amount of work that workers have to perform and usually consists of 'perceived' and 'actual/objective' workload (Jex, 1998; Cooper et al., 2001). Stress researchers have been particularly interested in perceived workload since an individual's perception of his/her environment is critical for the experience of strain. Perceived workload is further divided into 'quantitative' and 'qualitative' workload. Quantitative workload is defined as the sheer amount of work required and the time frame in which work most be completed (Jex, 1998; Cooper et al., 2001). Qualitative overload occurs, on the other hand, when individuals believe they do not have the necessary skills or capabilities to conduct their tasks (Cooper et al., 2001). In addition, perceived workload is often considered conceptually proximal to 'role

overload,' defined as the stressor that occurs when people perceive the demands of work as excessive (Jex, 1998; Jones, Flynn, & Kelloway, 1995).

Strains are a multitude of negative ways that individuals may respond when faced with stressors (Goldberger & Breznitz, 1993; Jex, 1998). Note that individuals may respond to stressors in a positive or a neutral way. In this case, the response would not be regarded as strain (Jex, 2998). Strains are generally classified as psychological, physical, or behavioral. Psychological strains usually include anxiety, depression and job dissatisfaction. Physical strains are symptoms ranging from headaches to coronary heart disease. Behavioral strains, especially in a workplace, include poor productivity, turnover, and absenteeism.

Stress is defined from one of the three perspectives: (1) the stimulus-based view; (2) the resource-based view; (3) the transactional view (Cary L. Cooper, Dewe, & O'Driscoll, 2000; Cary L. Cooper et al., 2001; Goldberger & Breznitz, 1993; 1998; Kasl, 1983). The stimulus-based view focuses only on stressors for describing stress (e.g. working conditions), while the resource-based view sees stress as strains, such as psychological reactions to these working conditions (Furnham, 2005). Until recently, psychological stress studies have been dominated by these two perspectives.

Despite their dominance, such 'one-component' perspectives (e.g., focusing only on stressors or strains) do not adequately predict whether a *particular* individual is under stress, since what is stressful for one individual may not be stressful for another (Cary L. Cooper et al., 2001). Also, these one-component perspectives explain little about the perceptual and cognitive processes of stress. Since stress involves both a stimulus and a

response in relation to one another, the relational nature of stress should be included in any definition (Lazarus, 1990).

To deal with such criticisms, a third perspective was developed which incorporated both stimulus and response elements as well as possible intervening factors such as personality differences (Furnham, 2005). This perspective, which emphasizes the dynamics of relationships between stressors and strains, is called the transactional view (Cary L. Cooper et al., 2001; S. Fisher, 1989; Wells, 1982). This view states that stress involves disturbances in the relationship between individuals (responses) and their environment (stimulus) (Cary L. Cooper et al., 2001). In this view, stress does not reside solely in the individual or solely in the environment but in the conjunction between the two (Edwards & Cooper, 1990; Tansey, Mizelle, Ferrin, Tschopp, & Frain, 2004; Van Harrison, 1978; Xie, 1996). In other words, the stress process can be considered a continual transaction between external demands and constraints, external supplies and supports, personal resources and internal needs or values to be balanced (Caplan, 1987; Daniels & Guppy, 1994).

Perceived Job Characteristics - The Demand-Control Model

Theoretical background

Karasek's (1979) Demand-Control (D-C) model is one of the most recognized and influential job characteristics models. The D-C model was founded upon two distinctive academic research streams: psychological strain and job satisfaction. Karasek (1979) found that research on psychological strain tended to focus on job demands (e.g., workload and role overload) as its antecedent but not on autonomy, while research on job

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satisfaction tended to focus on autonomy as its antecedent and ignored job demands (Karasek, 1979). The study concluded that job characteristics, job demands and autonomy, must be analyzed at the same time, since omitting one could result in misinterpretation and/or inconsistent findings (van der Doef & Maes, 1999).

The model

The Demand-Control model therefore consists of two psychosocial job characteristics: perceived job demands and job control (see Figure 2 below). According to Karasek and Theorell (1990), job demands are psychological stressors present in the work environment. Examples of the psychological demands of work include requirements for working hard, having a great deal to do, not having enough time, and having conflicting demands (Xie, 1996). In contrast, perceived job control represents the potential control that workers have over their tasks in the workplace, and is made up of two distinctive constructs: autonomy and skill discretion. Autonomy is the authority that workers possess to make decisions on the job, while skill discretion is the breadth of skills used by the worker on the job (Cary L. Cooper et al., 2000; Robert A. Karasek, Triantis, & Chaudhry, 1982). In a strict sense, perceived job control is not a stressor but the lack of job control or autonomy can be a stressor (Susan E. Jackson, 1983). While the D-C model does not refer to lack of control as a stressor, some researchers have proposed and found the direct effect of 'lack of control' on psychological strain (Terry A. Beehr, Glaser, Canali, & Wallway, 2001).
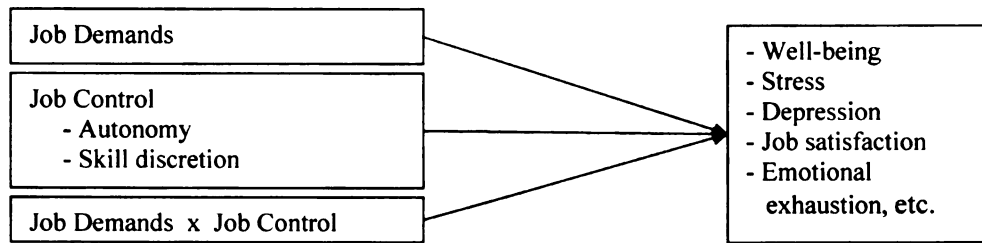
Figure 2: Karasek's Demand-Control Model and Proposed Outcomes

For more than 20 years, many studies have applied the Demand-Control (D-C) model and its hypotheses to a broad array of outcomes, particularly psychological well-being: stress, exhaustion, depression, job/life satisfaction, work-family interference, anxiety, and burnout (e.g., Butler, Grzywacz, Bass, & Linney, 2005; de Jonge & Schaufeli, 1998; de Rijk et al., 1998; Janssen, Peeters, de Jonge, Houkes, & Tummers, 2004; van Vegchel, de Jonge, & Landsbergis, 2005). In contrast, only a limited set of studies have examined behavioral outcomes such as the number of sick days, job performance, and organizational citizenship behavior (de Jonge, Reuvers, Houtman, Bongers, & Kompier, 2000; Jex, 1998; Noblet, McWilliams, Tea, & Rodwell, 2006).

The uniqueness of the D-C model lies in its examination of the interaction effects of job demands and job control. Karasek (1979) proposes that although excessive work demands may be associated with higher levels of psychological strain, the impact of these demands may be offset by the perception that one has control over important aspects of the work environment. In order to explain the interaction, Karasek (1979) developed a 2-by-2 matrix in which there are high and low job demands as well as high and low job control. The four possible outcomes of the interactions are labeled as follows: low-strain (high control-low demands), passive (low control-low demands), active (high control-

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high demands) and high-strain (low control-high demands). According to Karasek

(1979), stress is more likely to occur in 'high-strain' jobs that are simultaneously high in

job demands and low in job control. In other words, the source of work stress is not job

demands, but the high level of job demands in combination with a lack of job control.

This interaction effect has been attracted by considerable theoretical and

methodological criticism, however. This is primarily because there is no consensus in

conceptualizing and operationalizing the interaction effects of job demands and job

control (Xie, 1996; de Rijk et al., 1998; de Jonge et al., 1999; Beehr et al., 2001; Wong et

al., 2007; de Jonge & Kompier, 1997; van der Doef, 1999). Originally, Karasek (1979)

proposed that the interaction effect could be expressed by the following formula:

Interaction effect = job demands – job control

However, such conceptualization and operationalization of the interaction effect is

different from the more prevalent way of conceptualizing and operationalizing interaction

effects, which is expressed by the following formula (Edward & Cooper, 1990; Ganster

& Gusilier, 1989; Beehr et al., 2001):

Interaction effect = job demands x job control

This is called a 'multiplicative' interaction (Cappelli & Sherer, 1991; Clegg,

1984; Morgeson & Campion, 2003; Parker et al., 2001). Studies that conceptualize

interactions in this way consider perceived job control as a buffering factor reflecting individuals' perceptions of their specific work environment (Cooper et al., 2001).

Although the 'multiplicative' interaction is conceptually distinct from the 'relative excess' interaction, studies, including Karasek's later pieces (R. A. Karasek, 1989; Robert A. Karasek et al., 1982), began to use these two formulas interchangeably for examining the interaction effects of job demands and job control. As a result, some studies found evidence of interactions (de Jonge et al., 1999; Robert A Karasek, 1979), while others found no interaction effects (de Rijk et al., 1998; Fletcher & Jones, 1993). Yet others have found that the empirical results changed depending on how the interaction effects are statistically interpreted (Edwards & Cooper, 1990; van der Doef & Maes, 1999; van Vegchel et al., 2005). Having a sound theoretical rationale is essential for examining the Demand-Control interaction (Terry A. Beehr et al., 2001).

At the same time, however, it is worth mentioning that the majority of prior studies have found evidence of the direct/main effects of job demands and job control on various psychological outcomes. In other words, job demands and job control are still significant factors that independently affect individuals' psychological states such as stress and depression, when considering lack of autonomy/skill discretion as a stressor. As mentioned previously, some researchers have proposed and found the main effects of both job demands and job control on stress (Terry A. Beehr et al., 2001; Hendrix, Ovalle, & Troxler, 1985; Susan E. Jackson, 1983).

Other previous studies have identified posssible sources of inconsistent empirical findings, a major shortcoming of the D-C model (Terry A. Beehr et al., 2001; de Jonge & Kompier, 1997; de Jonge & Schaufeli, 1998; de Rijk et al., 1998; Theorell & Karasek,

1996; van der Doef & Maes, 1999). For example, such findings may result from the problematic nature of the variables of job demands and control. Researchers have warned against the use of a global index of perceived job control, which consists of autonomy and skill discretion, since it may mask the impact of some forms of control (Cary L. Cooper et al., 2001; de Jonge & Kompier, 1997). In fact, some studies have empirically tested the dimensionality of job control and concluded that studies using the D-C model should not use the global job control measurement (Carayon & Zijlstra, 1999; C. S. Smith et al., 1997).

Social Support

Stress researchers have been interested in exploring possible contextual factors that affect stressor-strain relationships (Cooper et al., 2001). Social support is one of these factors and is considered a resource or coping mechanism that may reduce an individual's stress level. Social support in the workplace is a helpful social interaction available on a job from both coworkers and supervisors (Dawn S. Carlson, 1999). More specifically, social support is an interpersonal transaction that involves emotional concern, instrumental aid, information, or appraisal at work (Terry A. Beehr et al., 2000; Dawn S. Carlson et al., 2000; Ducharme & Martin, 2000; Etzion, 1984; C. D. Fisher, 1985; LaRocco, House, & French, 1980; Parasuraman et al., 1992; Schaubroeck, Cotton, & Jennings, 1989; Searle et al., 2001; Seers et al., 1983; Wells, 1982).

There has been substantial research on the relationship between social support and psychological well-being and physical outcomes (Dawn S Carlson & Perrewe, 1999; Kaufmann & Beehr, 1986). In particular, considerable research has examined the impact

of social support on stress (Beehr, 1995; Jex, 1998). In fact, Johnson (1988) presented an expanded 'Demand-Control-Support (D-C-S)' model that introduces the notion of 'iso-train,' in which jobs with high demands, low control and low social support are more likely to induce heart disease, fatigue, and other health problems (Karasek et al., 1982). They argue that job-related social support may facilitate successful coping with high strain jobs, by preventing or buffering the potential harmful effects of jobs (Karasek & Theorell, 1990).

The types, sources, and mechanisms of social support have received significant attention within the research on the subject (Ducharme & Martin, 2000). In terms of types of social support, for example, research has proposed various taxonomies that suggest different dimensions of social support: instrumental, active, and material support (Cobb, 1979); affect, affirmation, and aid support (Kahn & Antonucci, 1980); tangible, informational, and emotional support (Cohen & Wills, 1985; House, 1983). Among these taxonomies, two types of social support have been studied the most: instrumental and emotional support (Beehr et al., 2000). Instrumental support refers to the different types of tangible help that others may provide, such as material assistance in response to specific needs (Ducharme & Martin, 2000). Emotional support, on the other hand, refers to the things, such as sympathy, that provide the receivers with feelings of being accepted and cared for (Beehr et al., 2000).

Research has been interested in sources of social support, though in a limited sense. For instance, previous studies have been sensitive to the distinction between the two sources of social support (Dawn S. Carlson, 1999); one from a work domain, such as supervisors and coworkers; the other from a non-work domain, such as family and

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spouses (Dawn S Carlson & Perrewe, 1999; Wallace, 2005). However, these studies have paid less attention to comparing and contrasting sources of social support *within* a work domain. Such insensitivity becomes apparent when operationalizing social support at work. For example, Etzion's (1984) social support indicator consists of ten items asking about the quality of the relationship with all of supervisors, coworkers, and subordinates. Karasek et al. (1982) initially differentiated supervisor support from coworker support but later combined them into one social support measure due only to a methodological reason (high factor loading). As a result, discussions about the differences between supervisor and coworker support have rarely occurred in social support studies (Ducharme & Martin, 2000). Similar to other studies, these examples demonstrate how research has typically combined supervisor and coworker support despite the fact that they may be distinct constructs. As such, it is important to understand these differences in the context of social support studies (Ducharme et al., 2000).

Some researchers have warned that coworker support may not work in the same way that supervisor support works (Cohen & Wills, 1985). For example, House (1983) states that informal and nonprofessional support, such as that from family, friends, and coworkers, should be more focused on as primary sources, since they are much more commonly mentioned when people are asked to name actual sources of support. Though few, there are empirical studies that compared the effect of supervisor support with that of coworker support (House, McMichael, Wells, Kaplan, & Landerman, 1978; Robert A. Karasek et al., 1982; LaRocco et al., 1980), but these findings were not fully incorporated into later studies.

In terms of the mechanism of social support, there are two dominant hypotheses to explain the effect of social support on an individual's stress level (Jex, 1998; Cohen & Wills, 1985; Beehr, 1985). The first hypothesis states that social support may work directly to reduce psychological strains and increase well-being. This is called the 'direct/main' effect of social support (Cohen & Wills, 1985). The underlying assumption of the hypothesis is that social support may provide positive affect, a sense of predictability and stability in one's life situation, and recognition of self-worth. These, in turn, are posited to prevent negative experiences that lead to psychological and physical disorders (R. Karasek & Theorell, 1990). The second hypothesis is suggestive of social support as a moderator/buffer to reduce the positive relationship between stressors and the outcomes (Terry A. Beehr et al., 2000; Ducharme & Martin, 2000; D. C. Ganster, M. R. Fusilier, & B. T. Mayes, 1986; Jex, 1998; Kaufmann & Beehr, 1986; Parasuraman et al., 1992). In other words, the strength of the relationship between stressors and the outcomes depends on the level of social support; when social support is high, the relationship between stressors and their outcomes is relatively weak. In contrast, if social support is low, the relationship between stressors and the outcomes becomes stronger.

While many studies have found evidence of the direct effect of social support, there is considerable debate over the moderating/buffering effect of social support (Terry A. Beehr et al., 2000; LaRocco et al., 1980). The notion of the moderating/buffering effect seems intuitively appealing, but the research on social support as a moderating variable is far from conclusive (Carlson & Perrewe, 1999). Some studies have found evidence for this hypothesis (Cohen & Wills, 1985; Daniels & Guppy, 1994; Etzion, 1984; Kaufmann & Beehr, 1986; Seers et al., 1983), while others failed to find such

evidence regarding the moderating/buffering effects of social support (Terry A. Beehr et al., 2000; Ducharme & Martin, 2000; C. D. Fisher, 1985; D. C. Ganster et al., 1986; LaRocco et al., 1980; Seers et al., 1983).

My examination of the dataset prior to this dissertation analysis showed mixed results in terms of the moderating/buffering effect of social support on the relationship between job characteristics (job demands and job control) and an individual's stress. Using multiplicative interaction terms and the procedure suggested by Baron and Kenny (1986), the empirical results showed that coworker support moderated the relationship between job demands and stress, but not the relationship between job control (autonomy and skill discretion) and stress.

The methodological and conceptual rationales for the inconsistent findings regarding the moderating/buffering effects of social support have been discussed in the literature. For methodological reasons, Ganster et al. (1986) noticed that the evidence of the moderating/buffering effect might depend on the source of support, the people who receive such support, and the stressors/strains chosen for a study. Other studies have pointed out measurement unreliability, low statistical power, and specification of social support (Dawn S. Carlson, 1999; C. D. Fisher, 1985; L. T. Thomas & Ganster, 1995).

Like the Demand-Control interaction, however, a fundamental problem of the moderating/buffering effect of social support is a lack of theoretical rationale (Dawn S. Carlson, 1999; Cary L. Cooper et al., 2001; Jex, 1998). For example, Cooper (2001) observed the problem of using a moderator/buffer approach to analyze the stressor-strain relationship:

> "(J)ob stress research has investigated a very large array of
> moderator variables, sometimes with little theoretical

rationale for their inclusion in a study's design, resulting in inconsistent (and frequently ambiguous) findings about the role of these variables. We suggest that it is important now to move beyond the simple identification of potential moderator variables to more comprehensive theories that attempt to explain the mechanisms by which all relevant factors interact. Furthermore, even when moderators are selected on a theoretical basis, empirical findings often simply demonstrate a moderator effect rather than explicating the role that the moderator plays in the stress process (p. 147)."

Similar to the Demand-Control interaction, the above arguments demonstrate the imperative nature of developing a solid theoretical foundation when testing the effect of social support on psychological outcomes. This dissertation, therefore, uses the Social Information Processing (SIP) approach to explain how social support affects the relationship between job characteristics and social support.

Social Information Processing (SIP) Approach

The concept

Studies of job characteristics have often been criticized for failing to reflect on factors that influence and constrain choices of job design (Adams, 1965). In fact, most studies of job attitudes and task design have been discussed in the 'need-satisfaction paradigm,' which emphasizes individuals' predisposition for explaining behaviors. There have been not enough attempts to explore factors, other than dispositional ones, that alternatively explain work attitudes and behaviors (Cappelli & Sherer, 1991; Rousseau, 1978; Salancik & Pfeffer, 1978). Such factors are called 'contextual' factors and the term *context* refers to the set of surroundings that help to illuminate events (Rousseau, 1978, p. 522). In an organizational setting, contextual factors are characteristics of organizations,

individuals and their role in an organization, and other environmental factors including social information at work (Salancik & Pfeffer, 1978). As Blau and Katerberg (1982) suggested, contextual factors are important determinants, since people often spend a large amount of time understanding and interpreting information from their social context to determine their attitude and behavior.

Based on these arguments, Salancik and Pfeffer (1978) developed a theoretical model, called the Social Information Processing (SIP) approach, to explain how individuals develop their attitude and behavior toward job characteristics. They propose that job characteristics, such as conditions of a workplace, are not a given but rather are constructed by individuals' observing and interpreting information from their social context. According to Salancik and Pfeffer (1978), there are two paths to explain the effects of social information on individuals' attitudes and behavior. First, information from the social context and past actions directly shape individuals' attitude and behavior (Salancik & Pfeffer, 1978). Alternatively, social context focuses individuals' attention on certain information by making it more salient and provides expectations regarding individuals' attitudes and the logical consequences of such attitudes (Salancik & Pfeffer, 1978).

A number of studies have examined the effects of social information on job characteristics and outcomes, though predominantly in laboratory and field settings where a manipulation of social cues is possible. For example, O'Reilly and Caldwell (1979) found that major perceptions of task characteristics were informational influences in the forms of social cues about the tasks in addition to objective realities. Griffin (1983) used social cues from supervisors and found that both the objective task changes

and the informational cues from supervisors significantly influenced research participants' perceptions of task attributes and their affective responses. The experimental study of Griffing et al. (1997) reported how research participants perceived various social cues to determine their attitudes and behavior toward their assigned jobs. They provided participants with three forms of manipulated social cues: written descriptions of the job, written evaluations by others who had done these tasks, and verbal statements from the experimenters. They found that social information as well as the objective elements of tasks affected perceptions of job characteristics. Field studies examined an even broader range of social cues. For instance, Zalesny and Farace (1986) used the agency newsletter for manipulating social cues. They found that socially-transmitted information focused a person's attention to certain aspects of the work/social environment of their organization. They also found that workers with socially-transmitted information tended to have more similar perceptions than those without such information. Thomas (1986) expanded the sources of social cues to family members, customers (patients) and other people working in the same hospital to examine how nurses used those sources to gather information. He found that, in addition to supervisors and coworkers, family members and people who are not immediate supervisors or coworkers were significant sources of social cues affecting nurses' perception of task characteristics.

Coworkers are an important source of social cues (Oldham, Kulik, Stepina, & Ambrose, 1986). In fact, a review of the SIP literature demonstrates that the most widely-used sources of social cues in empirical research have been coworkers and supervisors (J. Thomas & Griffin, 1983). Oldham et al. (1979) found that workers

determine their attitudes toward their job by comparing themselves with their coworkers. If they feel that they have fewer opportunities in the workplace, they are less internally motivated. In contrast, if they feel they have more opportunities compared to others, they are more likely to be internally motivated and perform well. White and Mitchell (1979) found that participants receiving positive social cues from coworkers were more satisfied and more productive than those receiving negative social cues from coworkers. These findings indicate that individuals indeed receive various social cues from their environment in terms of sources (e.g., supervisors, coworkers, and family members) and forms (e.g., verbal or written). However, social cues that have been used for previous studies are mostly arbitrarily provided by experimenters, primarily because most of these studies have been conducted in a laboratory setting.

As introduced above, social support is conceptualized as a flow of communication between people involving emotional concern, caring, and informational as well as instrumental help (Daniels & Guppy, 1994; Seers et al., 1983). From this definitional standpoint, social support could be a social cue that influences an individual's perception of job characteristics. However, previous studies have not explicitly used social support as one of social cues. This dissertation therefore takes the SIP standpoint and sees social support as a social cue, proposing that social support affects individuals' perceptions of job characteristics.

Demographic diversity/similarity

So far, this chapter has covered social support and its dependent and mediator variables (stress and job characteristics, respectively). This subsection reviews a possible

antecedent of coworker support, namely demographic similarity (see Figure 1).

Demography research assumes that there are compositional or demographic effects

caused by demographic distribution which are more than the sum of the effects of the

individual-level variants (Charles A. O'Reilly, Caldwell, & Barnett, 1989; Jeffrey Pfeffer,

1983; Jeffrey Pfeffer & Moore, 1980; Zenger & Lawrence, 1989). A number of studies

have found that demographic variety in organizations has substantial effects on

organizational outcomes, such as innovation, performance, executive succession, and

turnover (Susan E. Jackson, Joshi, & Erhardt, 2003; Frances J. Milliken & Martins,

1996; K. Y. Williams & O'Reilly III, 1998).

Demography research has been called diversity research, in which the term

diversity covers not only demographic compositions but also other elements found in an

organization, such as the length of service, educational background, and functional

background (Harrison, Price, & Bell, 1998; Jehn, Northcraft, & Neale, 1999; Frances J.

Milliken & Martins, 1996; van Knippenberg & Schippersand, 2007). Milliken and

Martins (1996) called these emerging elements of diversity 'underlying diversity' (e.g.,

personality, culture, skills, and tenure), as distinct from 'observable diversity' (e.g.,

demographic characteristics). Others use the term 'deep-level' for such underlying

elements, versus 'surface-level' diversity (Harrison et al., 1998). Yet others use terms

such as 'value,' 'social category,' and 'informational' diversity (Jehn et al., 1999).

While the majority of diversity research has been concerned with the proportion

of a certain demographic group, some research has argued that compositional property,

measured by the variance in demography within the unit, cannot adequately capture the

full impact of potential demographic effects (Chattopadhyay, Tluchowska, & George,

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2004; Tsui, Egan, & O'Reilly, 1992). As a result, it has been proposed that the effects of individuals' similarity to their work group or to their leaders as predictors of individual outcomes (Tsui & O'Reilly, 1989), which is called 'relational demography.' The key feature of relational demography is 'comparative' similarity or dissimilarity in given demographic attributes, such as age and gender, of supervisors, subordinates, or colleagues. In other words, workers compare their own demographic characteristics with those of other members of the unit. The level of perceived similarity in turn influences workers' identification with the unit (Tsui et al., 1992).

The mechanisms of demographic effects from either the traditional or relational view can be explained by a seminal framework called the similarity-attraction paradigm, which proposes that similarity of attributes such as attitudes and values increases interpersonal attraction and liking (D. E. Byrne, 1971). In this paradigm, individuals classify themselves and others based on categories that are salient such as age, gender, ethnicity, or status (van Knippenberg & Schippersand, 2007). They then tend to favor more, trust more, and be more willing to cooperate with group members than people outside the group (K. Y. Williams & O'Reilly III, 1998). Also, those individuals may share common life experience and values, since they may find that those with similar background interact more readiliy and are more attracted to each other (van Knippenberg & Schippersand, 2007).

A primary purpose of diversity research is to examine how diversity affects group process (e.g., cognitive processing, communication problems, and cohesiveness) and outcomes (e.g., performance, creativity, and problem-solving), as well as affective outcomes such as commitment and job satisfaction. Diversity studies, however, have

tended to focus more on performance outcomes than either the process or the affective outcomes. According to Jackson et al. (2003), only eight percent of the studies that they reviewed examined affective outcomes at the team level. Inconsistent empirical findings are a primary reason for the decline of such studies; diversity studies of affective outcomes (e.g.,. such as satisfaction) have sometimes positive, sometimes negative, and sometimes not significant findings depending on the particular dimension of diversity considered (Rico, Molleman, Sanchez-Manzanares, & Van der Vegt, 2007). Surprisingly, no study has examined the effect of demographic diversity on the level of social support that individuals perceive.

Reviewing the literature reveals that investigating the relationship among stress, social support, job characteristics, and demographic similarity is not a new idea. In fact, each paired set of concept has a research history: social support and stress, job characteristics and stress, and job characteristics and social support. However, the problem commonly identified among these concepts is the lack of a sound theoretical argument to explain the relationships. This dissertation therefore implements the Social Information Processing (SIP) approach, including the similarity-attraction paradigm, and the Demand-Control model of job characteristics to arrange the three concepts in a way that makes theoretical sense. In other words, this dissertation aims at developing and testing a cohesive theoretical argument regarding the causal linkages among stress, social support, and job characteristics. The next chapter proposes the model and discusses each concept in detail.

CHAPTER 3: MODEL DEVELOPMENT

Figure 1 represents the graphical representation of the proposed model. As the

figure shows, the model consists of four components: an individual's stress, job

characteristics, social (coworker) support, and demographic similarity. These four

components and the theoretical linkage of these components are discussed in detail.
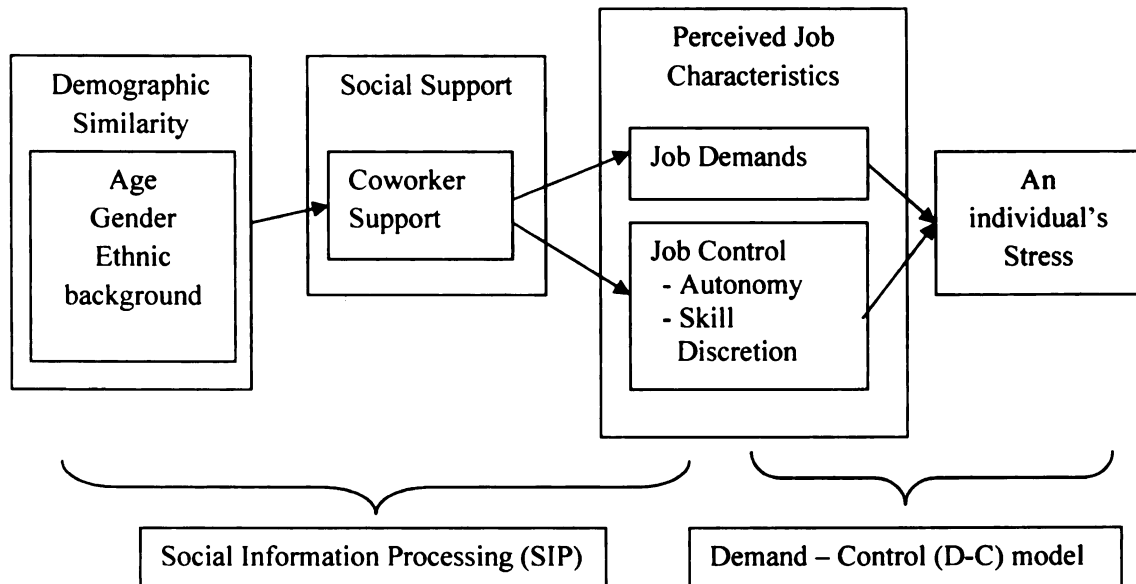
Figure 1: The Proposed Model

An individual's stress in this model is defined as a subjective feeling in response

to stressors in the environment (Wells, 1982). This definition takes the transactional

perspective, which considers stress as a continual transaction between external demands

and constraints (S. Fisher, 1989). As described in the literature review, the term

transaction implies that stress is neither in the environmental nor in the person, but

reflects the conjunction of a person with an environment (Lazarus, 1990). The term

transaction also implies a process, meaning that the stressor-strain relationship is not

static but is constantly changing as a result of the continual interplay between the person and the environment. Generally, researchers agree with the notion that term *stress* should denote the overall process incorporating stressors, strains, and the process. When operationalized, however, this notion contains a number of limitations in its ability to explain the stress process (Cooper et al., 2001).

Instead of searching for a single satisfactory measure that explains the stress process, this dissertation follows the suggestion by Lazarus (1990), in which a series of measures are developed to capture various aspects of the stress process or the stressor-stress relationship. In addition, the dependent variable of the model is called 'stress' instead of 'strain' throughout this dissertation, though it is a 'strain' in a context of a stressor-strain relationship. The process of stressor-strain relationship will be discussed later in the context of the 'Demand-Control' model.

Social support is an important resource, or coping mechanism, that can reduce the negative effect of stressors (Daniels & Guppy, 1994). Previous studies define social support as an interpersonal transaction that involves emotional concern, instrumental aid, or appraisal (Dawn S Carlson & Perrewe, 1999; House, 1981a; Kaufmann & Beehr, 1986; Wallace, 2005). As this definition indicates, social support contains both instrumental and emotional support. Instrumental support refers to providing material or practical assistance in response to the individual's specific needs, such as information, financial aid, and help with one's tasks (House, 1981a). Emotional support, on the other hand, involves providing individuals with the feeling of being cared for, and includes empathy, affection, understanding, and trust (House, 1981a; Wallace, 2005). In addition to instrumental and emotional support, this proposed model includes another dimension of

social support: a sense of belonging that workers perceive from their coworkers. Researchers have argued that feelings of being a part of the group are also an important invisible support that workers receive from their coworkers (Berkman & Syme, 1979; Cohen & Wills, 1985; House, Robbins, & Metzner, 1982). Social isolation, or a lack of a sense of belonging, is the most serious phenomenon for individual workers that affects individuals' health outcomes because it decreases the availability of social support from others in a workplace (Salancik & Pfeffer, 1978). Based on the above argument, social support in this proposed model is therefore defined as an interpersonal transaction that involves emotional concern, instrumental help, flow of information, a sense of belonging to the group, and the feeling of being cared for.

This dissertation focuses only on a single source of social support in the workplace: coworker support. Although previous studies have paid less attention to comparing and contrasting sources of social support *within* a work domain, this dissertation proposes that differences exist between supervisors and workers especially in terms of the relationships, such as 'supervisor-subordinate (worker)' and 'worker-worker' relationships. First, there is a structural difference between the two relationships. While relationships among workers are considered horizontal, relationships between workers and their supervisors are considered vertical. In a horizontal relationship, interactions more likely take place on one-to-many basis, while in a vertical relationship, interactions are more likely done on one-on-one basis. This structural difference also includes power differences between workers and their supervisors. Furthermore, there is a difference in physical and psychological distance; in most cases supervisors are more physically and psychologically distant from workers than their colleagues are. Such

physical and psychological closeness affects not only the numbers of interactions, but also the significance of the impact that social support has on individuals. Based on the above argument, this dissertation considers coworker support as distinct from supervisor support.

There are two theoretical paths for explaining the effect of coworker support on an individual's stress. As introduced in the previous chapter, coworker support may directly reduce strain by providing positive affect and a sense of predictability as well as preventing negative experiences (Fisher, 1985; Karasek & Theorell, 1990; Carlson & Perrewe, 1999). Alternatively, coworker support may affect an individual's perceptions of job characteristics, which in turn determine the level of stress. In other words, in the presence of environmental stressors, the perceived job characteristics in this case are either not perceived, or are objectively reduced through the instrumental aid of the supporter. In this proposed model, coworker support is considered a social cue that helps construct an individual's perception of the job characteristics. Again, this argument is based on the Social Information Processing (SIP) approach, proposing that individuals' perceptions are influenced by the social environment or by the network of social and informational relationships (Salancik & Pfeffer, 1978).

Job characteristics in this proposed model consist of perceived job demands and job control. Note that job characteristics in this proposed model are 'perceived' job characteristics, not 'objective' characteristics; hereinafter the term *job characteristics* in this dissertation indicates perceived job characteristics. Jex (1998) lists job demands as one of the primary sources of stressors in the workplace. Job demands are referred to as the amount of workload that individuals perceive regarding their job (Robert A Karasek,

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1979). In other words, psychological job demands are the perception of 'how hard you work' (R. Karasek & Theorell, 1990). In this regard, it does not include dimensions such as 'actual' workload (Jex, 1998), 'physical' workload (R. Karasek & Theorell, 1990), and 'qualitative' workload (Fletcher & Jones, 1993; Landsbergis, 1988). However, job demands in this model may overlap with other common research perspectives associated with job-related stress, such as Kahn's (1964) role overload.

Job control represents the potential control that workers have over their tasks during a working day (Karasek, 1979). In this proposed model, job control consists of two dimensions: autonomy and skill discretion. Autonomy is the authority that workers possess to make decisions on the job, and skill discretion is the breadth of skills used by the worker on the job (R. Karasek & Theorell, 1990). Although some studies combine these two dimensions into a single construct of job control (R. Karasek & Theorell, 1990), this dissertation takes the position that autonomy and skill discretion are closely related but conceptually distinctive (Carayon & Zijlstra, 1999; C. S. Smith et al., 1997), and should not be combined into a composite job control measurement (Edwards & Cooper, 1990; Tansey et al., 2004; Van Harrison, 1978; Xie, 1996).

In this model, job demands and job control are the important determinants of the level of an individual's stress. Job demands themselves have potentially negative effects on the physical and psychological state of individuals, while a person's ability to control the environment has the potential to lead to positive consequences. As mentioned in the literature review, the two determinants are developed based on the Person-Environment fit (P-E fit) approach of stress, which articulates that a strain develops when there is a misfit/discrepancy between the demands of the job and the abilities of a person to meet

those demands (Edwards & Cooper, 1990). The misfit/discrepancy is often called an 'interaction effect' of job demands and job control, and is hypothesized to generate deleterious psychological, physiological and behavioral outcomes, including stress (van der Doef & Maes, 1999; van Vegchel et al., 2005).

The proposed model, however, does not introduce any forms of interaction effects of job demands and job control (e.g., relative excess, multiplication, and ratio/proportional – see the previous chapter). In other words, the interactional/transactional nature of an environment and a person in this model is not conceptualized by the interaction term of job demands (an environment) and job control (a person), primarily because no form of the interaction effect could adequately express the 'continuous' transaction of stressor-strain relationships. Since the stress measure of this dissertation captures that aspect of stress process, the proposed model focuses simply on the effect of two determinants of an individual's stress.

Finally, demographic similarity in this model is defined as the compositional distribution of team members across any personal attribute that potentially leads to the perception of being different/similar from each other (Tsui & O'Reilly, 1989). Note that the term *team* in the above definition does not necessarily imply teams in a strict sense; teams in this model include occasions in which coworkers simply work with others regardless of whether they are formally considered team members. According to Pfeffer (1983), demography is the composition of a unit in terms of basic attributes such as age, sex, educational level, length of service or residence, and race. In this dissertation, demographic similarity is assessed by similarity in age, gender, and ethnic background.

The relationship between demographic similarity and coworker support is explained by the similarity-attraction paradigm, which can be considered a branch of the Social Information Processing (SIP) approach. In this paradigm, individuals who have similar demographics (e.g., age, gender, and ethnic background) are more likely to share common life experience and values. People may find that those with similar backgrounds interact more easily, and may be more attracted to each other (Reuben M Baron & Kenny, 1986). This similarity increases group members' sense of identification and integration with the group (Hodson, 2005). Consequently, it elicits more cooperative behavior toward coworkers. Note that the proposed model focuses only on the effect of demographic similarity on coworker support. In other words, demographic similarity is treated as an antecedent of coworker support, instead of a predictor of stress.

In sum, the model proposes that the three components discussed - demographic similarity, coworker support, and job characteristics - play a critical role in explaining an individual's stress level. Coworker support helps construct an individual's perception of job characteristics, which in turn influences the level of an individual's stress. In addition, demographic similarity promotes the social support of coworkers in the workplace.

CHAPTER 4: HYPOTHESES

Based on the proposed model introduced in the previous chapter, this dissertation examines the relationship between social support and an individual's stress (Path A) by introducing a mediating effect of job characteristics. For establishing the mediating effect, variations in social support should account for variations in an individual's stress (Path A), which is a fundamental assumption of the model. Based on this assumption, Baron and Kenny (1986) suggest the following three conditions for mediating effect. First, in Figure 3 below, variations in coworker support account for variations in job characteristics (Path B). Second, variations in job characteristics account for an individual's stress (Path C). Third, when job characteristics are given, the previously significant relationship between coworker support and stress (Path A) becomes less/not significant.
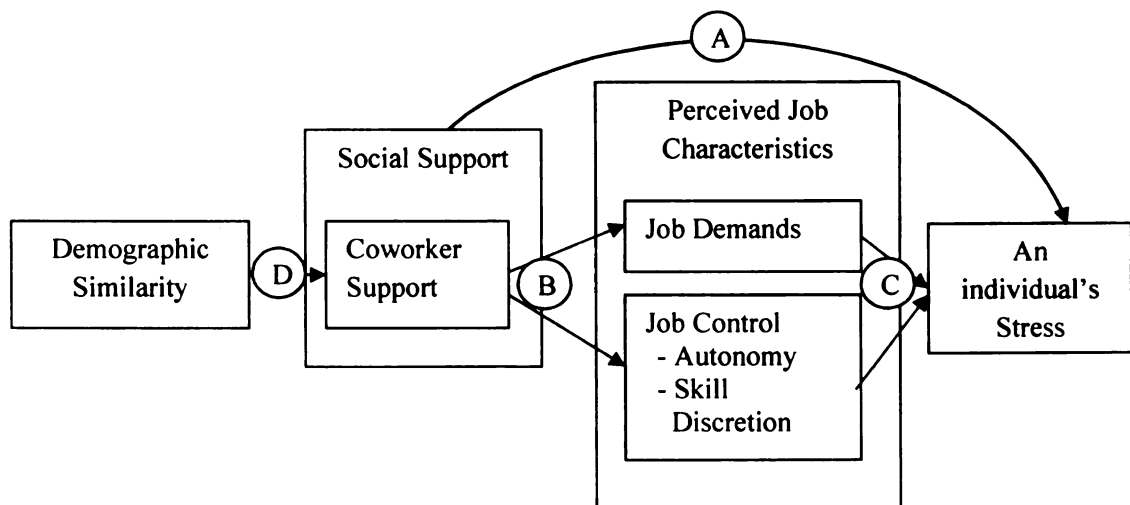
Figure 3: The Theoretical Paths

The hypotheses below regarding the mediating effects of job characteristics are developed as follows: (1) a discussion of the relationship between coworker support and stress (Path A); (2) a discussion of the relationship between coworker support and job

characteristics (Path B); and (3) a discussion of the relationship between job characteristics and stress (Path C). Once the mediating effects of job characteristics are hypothesized, a discussion of demographic similarity is introduced to determine its relationship with coworker support (Path D).

Coworker Support and Stress

In a simple relationship between coworker support and stress, coworker support is an antecedent and is considered to have a direct/main effect on stress (C. D. Fisher, 1985). In this regard, coworker support is predicted to directly reduce tension because it may serve to lower the experienced strain and other negative outcomes (C. D. Fisher, 1985; LaRocco et al., 1980; Parasuraman et al., 1992; Schaubroeck et al., 1989; Seers et al., 1983; Wells, 1982). For instance, it provides individuals with a social network that may bring positive experiences and a set of stable and socially-rewarding roles in their work environment. Such experiences and roles lead to positive affect, a sense of predictability as well as stability in life situations, and the recognition of self-worth (Cohen & Wills, 1985). Consequently, coworker support helps reduce an individual's stress level. As introduced in the literature review, empirical findings have also indicated the direct effect of social support (Cohen & Wills, 1985; C. D. Fisher, 1985; Jex, 1998). In this dissertation, the direct effect of coworker is therefore predicted to have a positive effect on an individual's stress.

Coworker Support and Job Characteristics

In this proposed model, the relationship between coworker support and job characteristics is explained by the Social Information Processing (SIP) approach, in which coworker support is considered as an antecedent of job characteristics. Some empirical findings in previous studies underpin the argument that support in the workplace could be viewed as an antecedent of various outcomes (Bateman, Griffin, & Rubinstein, 1987; Charles A. O'Reilly & Caldwell, 1979; Schnake & Dumler, 1987). For example, Fisher (1989) found that social support served as an antecedent of an individual's perception of unmet expectations, which in turn affects job satisfaction. Schaubroeck et al. (1989) also examined coworker support as an antecedent of job satisfaction, which in turn affected turnover intention. Other studies found that social support affected perceived stressors, such as work time demands, work ambiguity/conflict, and control over tasks (C. D. Fisher, 1985).

In the context of the SIP approach, coworker support is a social cue for individuals that helps shape their perception of job characteristics. Researchers indeed have acknowledged that coworkers are an important source of social cues (Cohen & Wills, 1985). Griffin and colleagues (1983; R. W. Griffin et al., 1987) tested and found that individuals' perceptions of job characteristics were constructed based on their processing information from coworkers. White and Mitchell (1979) noted that participants receiving positive social cues from coworkers were more satisfied and more productive than those receiving negative social cues from coworkers. Since coworker support is a positive cue for individuals, it may help develop a positive work environment, and consequently, workers with high social support may be less likely to perceive job

demands as stressors in their work environment. Fisher (1985) concluded that social

support possessed a protective function that instills an ongoing sense of emotional

concern prior to the actual stressful event. In the presence of social support, individuals

may not perceive, or may perceive to a lesser extent, stressors such as job demands. In

other words, social support affects the appraisal of the environment where the perceived

stressor may be weaker when people perceive the environment as less threatening

(Oldham et al., 1986). In this regard, coworker support becomes a necessary resource to

redefine the potential for harm posed by one's work situation.

Social support may also work in a more practical way. For example, Thomas and

Ganster (1995) found that supportive supervisors affect workers' level of control over

their job. Such supervisor support includes accommodating a worker's flexible schedule

or allowing one to bring a child to work on a snow day, which provides more

freedom/flexibility for workers to conduct their tasks (P. R. Jackson, Wall, Martin, &

Davids, 1993). Although coworkers usually do not have such authority in a workplace,

they could provide instrumental support (e.g., trading work shifts to mitigate the impact

of an absence) that makes individuals feel more at ease in such an environment.

In the case of job control (autonomy and skill discretion), coworker support may

allow individuals to perceive an increased a sense of predictability that strengthens their

perceived ability to cope with imposed demands. In addition, workers may learn how to

exercise skills and autonomy by sharing information and observing their coworkers

(Tansey et al., 2004; Wallace, 2005). Thus, coworker support may enhance and promote

the perception of control over a job by providing instrumental help to clarify ambiguous

task responsibilities, organize work processes, and find ways to cope with work overload (Terry A. Beehr et al., 2001).

The Effects of Job Characteristics on Stress

In the D-C model, or nearly any theory of occupational stress, job demands are considered to be stressors, which bring negative outcomes such as work stress, exhaustion, depression, and high-blood pressure (C. L. Cooper, 1986; Hackman & Oldham, 1980; Jex, 1998; R. Karasek & Theorell, 1990). In contrast, autonomy and skill discretion are mostly considered as having a beneficial effect on stress since they provide individuals with opportunities to change the nature of the environment (Daniels & Guppy, 1994). Autonomy is the most important and the most extensively examined concept in job characteristics studies. According to Hackman and Oldham (1980), individuals tend to believe that their work outcomes depend substantially on their own efforts, initiatives, and decisions when autonomy is given. As autonomy increases, workers are more likely to feel responsible for their jobs, and consequently "they are more willing to accept personal accountability for the outcomes of their work," (Hackman & Oldham, 1980; p. 77). In addition, autonomy may reduce stress in practice by letting individuals design their work processes that fit their needs/schedules. For instance, Batt and Valcour (2003) suggest that autonomy in decision making translates into the employee's ability to control decisions, such as when, where, and how to integrate work and family responsibilities.

Compared to autonomy, the term *skills* in the context of job control takes various forms and measurements, including skill discretion (Dodd & Ganster, 1996), skill level (Frances J Milliken, Martins, & Morgan, 1998), skill variety (Voydanoff, 2004), and

learning opportunities (D. Byrne, Clore, & Worchel, 1966; Frances J. Milliken & Martins,

1996). However, these constructs share a common assumption that people "from

newborn to mature adults" (Hackman & Oldham, 1980; p. 78) always look for

opportunities to utilize their ability and to gain a sense of efficacy. When people have a

chance to develop and utilize their skills at work, such as problem-solving, taking

initiative, and active learning, it encourages self-confidence and a proactive stance, which

may lead to redued stress levels. The above discussions lead to the following mediating

hypothesis:

H1: Job characteristics (job demands, autonomy and skill
discretion) mediate the relationship between coworker support and
an individual's stress. The following hypotheses should hold in
order to confirm the mediating effects of job characteristics:

H1a: Coworker support is negatively associated with stress.

H1b: Coworker support is negatively associated with job
demands.

H1c: Coworker support is positively associated with
autonomy.

H1d: Coworker support is positively associated with skill
discretion.

H1e: When job characteristics (job demands, autonomy
and skill discretion) are controlled, the relationship between
coworker support and stress becomes statistically
insignificant.

Demographic Similarity and Coworker Support

The relationship between demographic similarity and coworker support is explained by the similarity-attraction framework. As introduced in the literature review, this framework states that people with similar backgrounds are more likely to share common life experiences and values, and are thus more likely to be attracted to each other (Hodson, 2005). They also find that such similarity makes it easier to interact and to communicate with each other (Williams & O'Reilly, 1998). In fact, Zenger and Lawrence (1989) found that age and tenure homogeneity are positively associated with the frequency of technical communication in teams. The similarity also increases group members' sense of identification and integration with the group (Bond, Galinsky, Prottas, & Thompson, 2003). Through communications and interactions, workers may find it easier to share their feelings with those who have similar backgrounds, which in turn fosters trust and cooperation among them (O'Reilly et al., 1993). The above discussion leads to the following hypothesis:

> *H2:* Demographic similarity such as age, gender, and ethnic
> background, is positively associated with coworker support.

CHAPTER 5: METHOD

<u>Sample</u>

The present study uses 2002 data from the National Study of the Changing Workforce, a survey conducted by the Families and Work Institute. Using random-digit dialing, a telephone survey interviewed a nationally representative sample of 3,504 adults who met the following criteria: (1) worked at a paid job or operated an income-producing business, (2) aged 18 years or older, (3) were in the civilian labor force, (4) resided in the continental United States, and (5) lived in a non-institutional residence with a telephone. The estimated response rate was 52.0 percent of eligible households contacted. Self-employed workers were excluded from the analyses, since it was not clear whether they had coworkers. This resulted in a sub-sample that includes 2,819 wage and salary workers out of the total 3,504.

<u>Development of Measures</u>

Since existing data were used for the analyses, measures were constructed from items asked of the survey respondents. The survey author, the Families and Work Institute, does not cite all the sources used in developing these items, but an effort has been made to determine how similar these items are to others used in previous studies. A complete list of measures, including all items, scales, and alphas, can be found in Appendix A. As the appendix indicates, there are eight total variables developed for the analyses: one dependent variable (an individual's stress), one independent variable (coworker support), three mediator variables (job demands, autonomy, and skill

discretion), and three antecedents of an independent variable (age similarity, gender similarity, and ethnic similairty).

To develop above measures, the survey instrument was examined for items related to the constructs of interest. For variables that are constructed from multiple items, appropriate preliminary scales were created and factor analyses were conducted. Factor analysis is a technique for analyzing interrelationships among a large number of items to explain these items in terms of their common underlying dimensions, called factors (Hair et al., 1998 from Kan). Because the source of dependent, independent, and mediator variables is the same, all the items used for composite variables were included in the explanatory factor analyses (EFA) to see if these composite variables are conceptually distinctive. The results indicate that there are six factors with eigenvalues over 1.0, which accounted for 57.52 percent of the total variance

The initial pre-rotated matrix indicates that items are most likely to be interrelated mainly because of the similarity of what was being measured; they are mostly individuals' perceptions of the work environment, such as coworker support, job characteristics and stress levels. Because the constructs were expected to be interrelated, a varimax rotation was used to simplify the interpretation. A varimax rotation method is an orthogonal rotation method that is suitable for minimizing the number of variables with high loadings.

The results of the rotated principal component factor analysis are shown in Appendix B. As shown in the appendix, all factor loadings were above 0.55 and the difference between the primary loading and the cross loading for all the items was less than 2.00, indicating that these six factors are fairly distinctive. Following the factor

analyses, alphas were calculated for each composite (multi-item) variable. The final variables are described in the next sections.

<u>Measures</u>

Stress

Stress is assessed with four items from the 16-item global measure of perceived stress developed by Cohen et al. (1983). The four items assess the degree to which situations in one's life are appraised as stressful. According to Cohen et al. (1983), this measurement shows adequate reliability and is correlated to psychological and physiological symptoms. A sample item from the survey includes the question, "How often have you felt nervous and stressed?" There are two additional items that exist in the survey that were from the global measure of stress, but they were dropped due to low factor loadings. A higher score indicates a higher level of an individual's stress. Cronbach's alpha for stress is 0.61.

Coworker Support

Coworker support is measured by three items developed for the survey. Although the survey author does not provide information about how these items were developed, they are consistent with the type of measurements used in previous studies to tap respondents' perceptions of the likelihood of receiving both on-the-job and off-the-job support (Ducharme & Martin, 2000). As mentioned in Chapter 3, the variable of coworker support combines one item from instrumental support and an other item from emotional support, which are, respectively: 'I have support from coworkers that I need to

do a good job' and 'I have support from coworkers that helps me to manage my work and personal or family life.' In addition, one more item is included that asks respondents if they feel that they are a part of the group that they work with. As discussed previously, a sense of belonging is an important part of coworker support that may change the significance of social support itself (Way, 2002; Zacharatos, Barling, & Iverson, 2005). In fact, some researchers have included similar items into their coworker support measurement (Cary L. Cooper et al., 2000). Cronbach's alpha for coworker support is 0.75. All three items are reverse-coded to create a single measure in which a higher score indicates higher levels of coworker support.

Job characteristics

Job demands, autonomy and skill discretion are measured by items developed for the survey. They are, however, consistent with the items developed by Karasek (1979). The job demands construct consists of four items, asking the level of individuals' workload that they perceive when performing their tasks. Initially, two additional items were included that asked respondents whether they have to work fast and hard. They were, however, extracted due to low factor loading. Since one of the four items has a different response scale (four-point scale ranging from strongly agree (one) to strongly disagree (four)) from others (five-point scale ranging from very often (one) to –never (five)), all the items are standardized. Cronbach's alpha for job demands is 0.77. A higher score indicates higher level of job demands. Autonomy is assessed by four items with a four-point response scale ranging from strongly agree (one) to strongly disagree (four). All items are reverse-coded and Cronbach's alpha of autonomy is 0.71. A higher

score indicates higher autonomy. Finally, skill discretion is measured with four items, asking about respondents' opportunity to learn and utilize skills, knowledge, and creativity. All items are reverse-coded, indicating that a higher score means more discretion in relationships. Cronbach's alpha for the variable is 0.71.

Demographic similarity

Demographic similarity is measured by three single-item demographic characteristics: age, gender, and ethnic background. A sample item; 'About what percentage of your coworkers are of people from your racial, ethnic, or national background?' Instead of answering the actual percentage, the survey respondents chose a category that is closest to their actual percentage (e.g. 1 -100%, 2 -75-99%, 3-50 -74%, 4-25 - 49%, 5-1-25%, and 6 - 0%). The problem with the scale, however, is that it is neither a ratio nor an interval scale. Therefore, the three items are corded as 1 = equal to or more than 50% of coworkers, and 0 = less than 50% of coworkers.

Control variables

In addition to the above eight variables, control variables regarding working conditions are included for the analyses: job tenure, work hours per week, job insecurity, and occupational types (Census 3-digit occupational codes). Although they are not the primary focus of the analyses, they could affect the results of the analyses by influencing independent, mediator and dependent variables. For example, a number of studies have found a significant correlation between the overall number of hours worked and various indices of health and well-being. Also, Theorell and Karasek (1996) suggest that

occupational differences play a significant role in determining the level of job control. According to Hanisch (1999), job insecurity may be one of the single most salient sources of stress for workers in contemporary workplaces.

In the analyses, job tenure consists of a single item asking respondents about their length of service in the current line of work. The work hours variable also consists of a single item asking hours of work per week. Job insecurity consists of a single item asking the extent to which respondents are likely to lose their current job. Finally, the respondents' occupation is measured using a single item asking what their occupation is, with responses coded on the basis of 2000US Bureau of Census Occupational Codes. The coded responses are then classified into seven categories of work: executives, administrative, and managerial; professional; technical; sales; administrative support; service; and production, operation, or repair. For the analyses, a dummy variable was created to represent each occupational category in which 1 indicates 'applicable' and 0 indicates 'all other cases.'

In addition, supervisor support is included as a control variable to avoid the confounding effect of this variable on the relationship between coworker support and stress. Supervisor support consists of nine items asking respondents if their supervisors are supportive in both instrumental and affective ways. Although some of them are slightly modified, the nine items are consistent with the type of measurement used in previous studies to examine supervisor support (Dawn S Carlson & Perrewe, 1999). To be consistent with coworker support, four instrumental support items and five emotional support items are combined to create a single variable. Cronbach's alpha of the variable

is 0.90. Items are coded such that a higher score indicates higher levels of supervisor support.

Variables related to demographic characteristics are controlled, since they are also potential factors that may affect the results of the analyses. In fact, researchers have suggested that age and gender play a significant role in determining the level of stress (Broman, Hamilton, Hoffman, & Mavaddat, 1995). Michelle and Gary (2001) found racial differences in burnout among managerial people. Broman et al. (1995) found that race, gender, and educational level interacted and affected the level of stress and drinking problems of blue-collar workers. Other studies have also found that marital status and family situations also affect significantly individuals' psychological strain (Gutek, Repetti, & Silver, 1988). Although whether non-work situations can be positive or negative factors remains unresolved, they do have a significant impact on an individual's stress (David P. MacKinnon, 2000). Based on these arguments, the following variables are included: gender, age, race, educational levels, marital status, having/not having children, and having/not having elderly people at home to take care of. Gender is recorded as a dichotomous variable indicating $1 =$ male and $0 =$ female. Age is also a single item asking respondents their age. Race consists of five categories: White, African American, Native American, Asian, and other. The category White is omitted for the regression analyses. Education has six categories: Less than high school diploma, high school diploma or GED, some college, associate degree, bachelor degree, graduate or professional schools; the category of high school diploma is omitted for the regression analyses. Respondents are asked about their marital status: married, remarried, living with spouse, single and never married; divorced, widowed, and separated; the category of

single is omitted for the regression analyses. Finally, two items ask respondents if (1) they are the parent or guardian of any child of any age including, own, stepchildren, adopted, foster, grandchildren, and (2) they have provided special attention or care for a person with more than 65 years old within the past year. They are dichotomously coded such that 1 = yes and 0 = no.

Analytic Strategies

Two statistical methods are employed for the analyses of the proposed model: multiple regression for the mediating effects and structural equation modeling (SEM). Multiple regression is an appropriate method for analyzing the relationship between a single dependent variable and several independent variables. The purpose of using multiple regression is to identify and evaluate the mediating effect of job characteristics. Structural equation modeling, on the other hand, allow for the development and testing of theories concerning observed and unobserved variables and their relationships. The purpose of using SEM analyses is therefore to examine and evaluate the overall fit of the proposed model in Figure 1. The major difference between multiple regression and SEM is that SEM provides a mechanism for explicitly taking measurement error in the observed variables into account (both dependent and independent variables), though it does not provide a clear and straightforward relationship between the proposed variables (David P. MacKinnon & Dwyer, 1993).

Multiple regression for the mediating effects

Baron and Kenny (1986) state that the following conditions must hold to establish mediation. First, the independent variable (coworker support) must affect the mediators (job characteristics). Second, the independent variable (coworker support) must affect the dependent variable (stress). Third, the mediators (job characteristics) must affect the dependent variable (stress). If a partial mediating effect of job characteristics exists, the independent variable (coworker support) should be less significant than it was in a simple coworker-stress relationship without mediators. In addition, if job characteristics are perfect mediators, coworker support shows no significance. In a more mathmatical way, MacKinnon et al., (1993) introduced the following equations;

$$\text{Formula 1: } Y_0 = \beta_1 + rX_P + e_1;$$

$$\text{Formula 2: } Y_M = \beta_2 + \alpha X_P + e_2;$$

$$\text{Formula 3: } Y_0 = \beta_3 + r'X_P + \beta X_M + e_3;$$

where Y_0 is the dependent variable (stress), X_P is the independent variable (coworker support), and X_M is the mediator (job characteristics). β_1, β_2, and β_3 denote the intercept for Formula 1, Formula 2, and Formula 3, e_1, e_2, and e_3 denote unexplained variability. The value of the mediated effect of job characteristics equals the difference in the independent variable coefficients ($r-r'$) in Formula 1 and Formula 3. If the independent variable coefficient (r') is zero when the mediator is included in the model (see Formula 3), then the effect of the independent variable is entirely mediated by the mediating variable.

Structural Equation Modeling

In this dissertation, structural equation modeling (SEM) is conducted using LISREL 8.80. As mentioned above, this analytical strategy is best suited for examining whether or not a proposed model explains the relationship between the independent variable (coworker support) and the dependent variable (stress) by way of mediators (job characteristics). Two methodological steps are taken for testing the proposed theoretical model; they are confirmatory factor analysis (CFA) and path analysis. Although SEM analyses cover both steps, the term SEM refers to path analysis throughout this dissertation.

Before describing both steps, note that four control variables that have multiple categories were condensed into dummy variables; they are race, marital status, education, and occupations. For example, originally there were five dummy variables for race: White, African American, Native American, Asian, and others. In the condensed version, however, race was expressed by a dummy variable (whether the survey participants were White or not). In the same way, marital status, previously consisting of three dummy variables, was dummy variable (are the survey participants married or not). In the case of education level, a dummy variable was created (did the survey participants receive a bachelor degree/higher degree or not). Finally, seven occupational dummy variables were compressed into a single dummy variable asking if the participants were executives/professionals or not. The purpose of simplifying these control variables is to reduce the degree of freedom of the proposed model, since having many parameters may reduce its testability. In Appendix A, these variables are labeled as follows: race 2, marital status 2, education 2, and occupation 2.

Confirmatory Factor Analysis (CFA) and Path Analysis

Confirmatory factor analysis (CFA) is used for examining patterns of interrelationships among several constructs (Raykov & Marcoulides, 2006). While explanatory factor analysis (EFA) seeks to uncover the underlying structure of a relatively large set of variables, CFA is used for determining if the number of factors and the loadings of measured variables on them confirm what is expected. The difference between EFA and CFA is that EFA does not necessarily require prior theory, while CFA is conducted based on pre-established theory. In other words, the number of factors in the model is hypothesized before conducting the analysis in the case of CFA. In this regard, CFA is the most common method to test the construct validity of survey items.

Path analysis model is used for testing two or more causal relationships among observable variables (Ku, 2006). Although some researchers do not consider path analysis models SEM analysis, this dissertation takes the perspective that path analysis shares a common underlying idea of model fitting and testing like any other SEM model (Hu & Bentler, 1995). This dissertation therefore uses the term SEM to indicate path analysis hereinafter. The goal of conducting SEM is to find the most parsimonious model, which is usually explained by the term 'fit.' This term represents the process that compares the population covariance matrix, $\sum$, to the restricted covariance matrix, $\sum (\Theta)$, implied by the proposed model (Hu & Bentler, 1995). In other words, for this statistical analysis, the null hypothesis (H_0) is that the population covariance matrix, $\sum$, is equal to the covariance matrix, $\sum (\Theta)$, based on the proposed model.

Model Fit

In this dissertation, the following three indices are used as methods of evaluating model fit for both CFA and path analysis: the chi-square (χ^2), the root-mean-square-error-of-approximation (RMSEA), and the comparative fit index (CFI). Although there are other indices for evaluating model fit, the analyses utilize the above three indices primarily because they are most commonly used by organizational researchers. Since each index has both strengths and weaknesses, it is better to use multiple indices for examining fit in a comprehensive way.

The chi-square (χ^2) is a test for evaluating the closeness between the sample covariance matrix, S, and the covariance matrix of the proposed model $\sum (\Theta)$. A large chi-square, relative to its degrees of freedom, indicates a 'poor fit' of the proposed model, while a small value indicates that the proposed model describes the data well. The problem of using the chi-square for the proposed model is, however, that the chi-square is not sensitive to the distribution of the observations when the sample size is large (Ku, 2006). As a result, in the proposed model the null hypothesis is more likely to be rejected. The remaining two indices, RMSEA and CFI, are considered measures that are least affected by sample size (Browne & Cudeck, 1993).

Root-mean-square-error-of-approximation (RMSEA) is a measure of the discrepancy between the sample, S, and the model-implied matrix per degree of freedom. The formula is as follows:

$$\text{RMSEA} = \sqrt{\frac{\chi_t^2}{df_t(N-1)}}$$

where χ_t^2 is the chi-square for the tested model, df_t is the degree of freedom for the model, and N is the sample size (Fan, Thompson, & Wang, 1999; Zacharatos et al., 2005).

When additional parameters are included in the model, they reduce the value of chi-square and the RMSEA will decrease to a minimum value of 0 accordingly. However, because RMSEA considers the degree of freedom (df), its value can increase as additional model parameters increase. According to Browne et al. (1993), a value of the RMSEA of about 0.05 or less would indicate a close fit of the model, in relation to the degrees of freedom; this evaluation is based on the assumption that an exact fit with the RMSEA equals 0.00. A value of about 0.08 or less for the RMSEA would indicate a reasonable error of approximation. Finally, if the value is equal to or greater than 0.1, the model would not be considered as a good fit.

Finally, Comparative Fit Index (CFI) compares the covariance matrix of the proposed model with the one based on the null hypothesis, meaning the covariance matrix of zeroes. The value of CFI is calculated by the following formula:

$$\text{CFI} = \sqrt{\chi_t^2 - df_t \Big/ \chi_n^2 - df_n}$$

It represents the percent of lack of fit which is accounted for by going from the null model to the proposed model. CFI ranges from 0 to 1, with a value greater than 0.9 indicating an acceptable fit (David P. MacKinnon & Dwyer, 1993).

Fit Indices for CFA

In this dissertation, CFA was performed to confirm the theoretical distinctiveness of the three job characteristics variables. The analysis started with the model in which twelve items (from V1 to V12) are loaded into three conceptual factors – job demands, autonomy and skill discretion – based on the Demand-Control model of job characteristics. Figure 4 shows the results from the initial analysis. The numbers to the left of the variables (from V1 to V12) are errors while the numbers to the right of the variables are t-values of each path coefficient. As the figure shows, all the t-values of the coefficients are significant. In terms of the fit indices, the three indices (chi-square, RMSEA, and CFI - not shown in the figure), showed the following results: chi-square = 509.87, RMSEA = 0.065 and CFI = 0.95. These results confirm that the model is acceptable.

Since, however, the above results indicated that autonomy and skill discretion were significantly related (t = 35.11 in Figure 4), the alternative model was also examined in which autonomy and skill discretion were combined into one single factor, job control (see Figure 5 below). The indices for the alternative model deteriorated significantly: Chi-square = 1201.37, RMSEA = 0.098, and CFI = 0.90. The results confirmed that autonomy and skill discretion were conceptually distinctive variables, though they were correlated.

The results of the SEM analyses are presented in the next chapter.
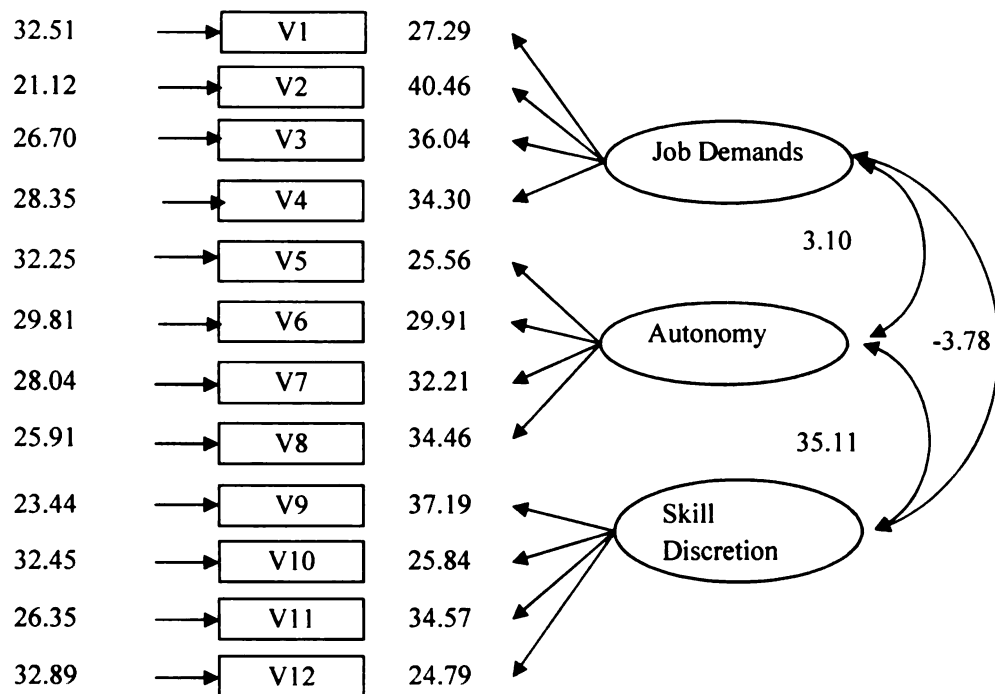
Figure 4: The First and the Final Model of Job Characteristics
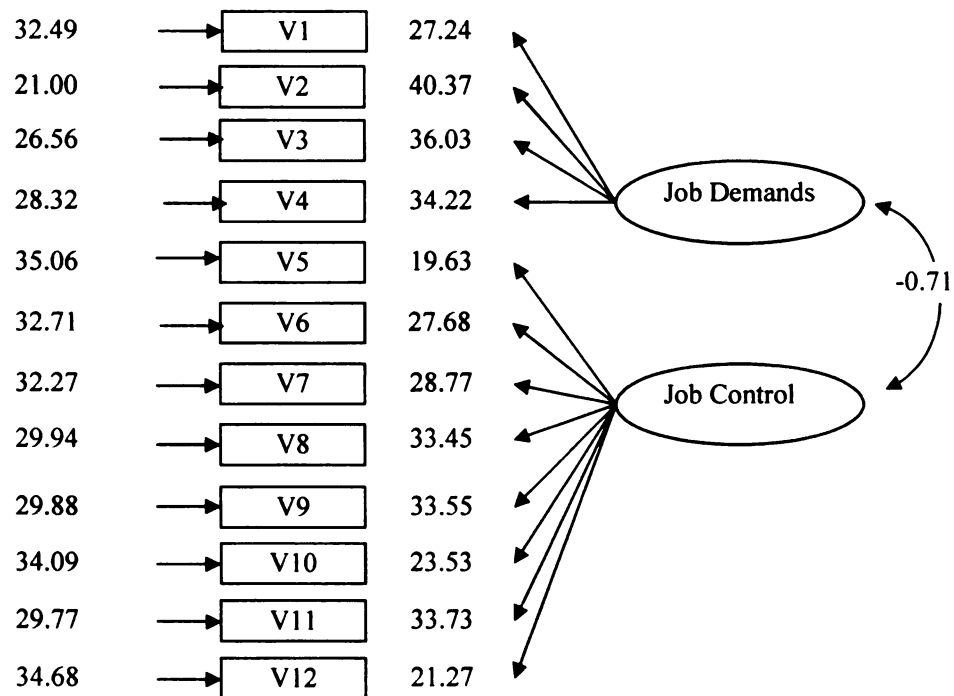
Figure 5: The Alternative Model of Job Characteristics

CHAPTER 6: RESULTS

<u>Descriptive Statistics</u>

The means, standard deviations, and other descriptive statistics of all variables are shown in Table 1 below.

Table 1: Descriptive Statistics of All Variables for the Analyses

	N	Min	Max	Mean	SD
Stress	2,788	1.00	5.00	2.343	0.777
Std Job Demands	2,777	-1.45	1.55	0.000	0.765
Autonomy	2,777	1.00	4.00	2.949	0.775
Skill Discretion	2,797	1.00	4.00	3.279	0.655
Coworker Support	2,773	1.00	4.00	3.429	0.631
Ethnic Similarity	2,764	0.00	1.00	0.764	0.425
Gender Similarity	2,787	0.00	1.00	0.817	0.387
Age Similarity	2,752	0.00	1.00	0.655	0.476
Gender (male=1)	2,810	0.00	1.00	0.513	0.500
Age	2,785	18.00	99.00	40.947	12.917
White	2,775	0.00	1.00	0.791	0.407
African American	2,775	0.00	1.00	0.104	0.305
Native American	2,775	0.00	1.00	0.010	0.101
Asian American	2,775	0.00	1.00	0.015	0.123
Other races	2,775	0.00	1.00	0.079	0.270
> Highschool	2,810	0.00	1.00	0.110	0.312
Highschool grad	2,810	0.00	1.00	0.308	0.462
Some college	2,810	0.00	1.00	0.206	0.405
Associate degree	2,810	0.00	1.00	0.090	0.287
Bachelor degree	2,810	0.00	1.00	0.195	0.397
Grad or professional degree	2,810	0.00	1.00	0.090	0.287
Married & Partner	2,802	0.00	1.00	0.653	0.476
Single	2,802	0.00	1.00	0.187	0.390
Divorced/Widowed/Separated	2,802	0.00	1.00	0.160	0.367
Have children	2,808	0.00	1.00	0.677	0.468
Have elder people	2,804	0.00	1.00	0.351	0.477
Supervisor Support	2,348	1.00	4.00	3.377	0.632
Job tenure	2,810	0.00	63.00	7.562	8.347
Hours per week	2,795	1.00	110.00	44.871	13.214
Job insecurity	2,758	1.00	4.00	2.008	0.947
OCC exectives	2,810	0.00	1.00	0.136	0.343
OCC professional	2,810	0.00	1.00	0.192	0.394
OCC tech	2,810	0.00	1.00	0.040	0.195
OCC sales	2,810	0.00	1.00	0.089	0.285
OCC admin	2,810	0.00	1.00	0.144	0.352
OCC service	2,810	0.00	1.00	0.128	0.334
OCC prod/oper/repair	2,810	0.00	1.00	0.266	0.442
Valid N (listwise)	2,145				

The mean of the composite scale measuring the degree of an individual's stress is

2.34 on a scale of one to five, indicating that overall individual workers do not feel

heavily stressed. The mean of the composite scale measuring the degree of coworker

support is 3.43 on a scale of one to four, indicating that, overall, individual workers

receive a fairly good level of coworker support in their workplace. In terms of job

characteristics, the job demands variable is standardized such that its mean is 0.00. The

mean of the composite scale of autonomy is 2.95 on a scale of one to four, while the

composite scale of skill discretion is 3.28; it indicates that respondents in the sample hold

a relatively higher degree of skill discretion, while they show moderate degrees of

autonomy.

Correlation Matrix

Examination of the zero-order correlations below (Table 2) indicates that stress is

significantly correlated with job demands, autonomy, skill discretion, and coworker

support. The job demands variable is positively associated with stress, while autonomy,

skill discretion, and coworker support are negatively associated with stress. These

directions of the correlations are consistent with the hypotheses of the model; job

demands were predicted to increase an individual's level of stress, while job control,

autonomy and skill discretion, were predicted to decrease an individual's level of stress.

No similarity variable (ethnic, age and gender) is found to be significantly correlated with

stress. In terms of demographic control variables, all marital status categories (e.g.

married, single, and divorced) show a significant correlation with stress, but in a different

way; while being married or having a partner shows a negative correlation with stress,

being single or divorced demonstrates a positive correlation with stress. Interestingly enough, having children or elder people at home to take care are not variables that are significantly correlated with stress.

In terms of work-related control variables, findings are generally consistent with previous research. For example, supervisor support and job tenure are negatively correlated with stress, while job insecurity is positively correlated with stress. Also, employment in some occupations, such as professional vocations, shows a negative correlation with stress, while employment in service occupations holds a significantly positive correlation with stress. This finding is consistent across three job characteristics, implying that certain occupations may affect the relationship between stress and job characteristics more than others.

Finally, coworker support shows significant correlations with stress and all three job characteristics proposed in the model. Coworker support is negatively correlated with stress and job demands, and positively correlated with autonomy and skill discretion. Also, coworker support demonstrates a significant positive relation with ethnic similarity, but not with gender and age similarity. Interestingly, coworker support is negatively correlated with gender, meaning that being male is correlated with decreasing coworker support. Coworker support shows no significant correlation with having children and older people at home to take care of. However, coworker support does show positive correlation with supervisor support, confirming the importance of controlling supervisor support for the regression and SEM analyses. In addition, longer work hours and job insecurity show negative correlations with coworker support.

Table 2: Correlation Matrix

	1	2	3	4	5
1 Stress	1				
2 Std Job Demands	.240(**)	1			
3 Autonomy	-.207(**)	-0.039	1		
4 Skill Discretion	-.171(**)	.091(**)	.431(**)	1	
5 Coworker Support	-.252(**)	-.180(**)	.283(**)	.382(**)	1
6 Ethnic Similarity	-0.040	-.055(*)	0.035	0.039	.072(**)
7 Gender Similarity	-0.015	-0.001	0.009	0.006	0.025
8 Age Similarity	0.003	-0.003	0.029	0.034	0.022
9 Gender (male=1)	-.108(**)	-0.028	.076(**)	0.016	-.047(*)
10 Age	-.135(**)	0.009	.083(**)	.068(**)	0.013
11 White	-0.014	0.030	.080(**)	0.038	.077(**)
12 African American	0.024	-0.017	-.087(**)	-.086(**)	-.085(**)
13 Native American	-0.020	-0.033	0.006	0.029	-0.036
14 Asian American	-0.008	0.027	0.000	0.005	-0.027
15 Other races	0.003	-0.027	-0.025	0.029	0.005
16 > Highschool	.121(**)	-0.020	-.151(**)	-.060(**)	0.016
17 Highschool grad	.046(*)	-.073(**)	-.096(**)	-.146(**)	0.001
18 Some college	-0.009	-.046(*)	0.029	-.055(*)	-0.040
19 Associate degree	-0.040	0.035	0.036	.061(**)	0.037
20 Bachelor degree	-.043(*)	.070(**)	.083(**)	.108(**)	-0.009
21 Grad or prof degree	-.080(**)	.068(**)	.113(**)	.157(**)	0.013
22 Married & Partner	-.087(**)	0.042	0.042	.114(**)	0.024
23 Single	.046(*)	-.077(**)	-.054(*)	-.106(**)	-0.002
24 Divor/Widow/Separat	.064(**)	0.027	0.003	-0.036	-0.030
25 Have children	0.036	.062(**)	0.030	.113(**)	0.006
26 Have elder people	0.012	.090(**)	0.033	0.018	0.001
27 Supervisor Support	-.277(**)	-.301(**)	.296(**)	.341(**)	.560(**)
28 Job tenure	-.089(**)	.065(**)	.102(**)	.105(**)	0.029
29 Hours per week	0.005	.264(**)	.087(**)	.153(**)	-.058(**)
30 Job insecurity	.215(**)	.136(**)	-.150(**)	-.173(**)	-.212(**)
31 Exectives	-0.023	.080(**)	.182(**)	.073(**)	0.009
32 Professional	-.059(**)	.086(**)	.085(**)	.265(**)	.051(*)
33 Tech	-0.013	0.032	0.036	0.027	-.044(*)
34 Sales	0.027	-0.003	0.032	-.056(**)	-0.030
35 Administrative	0.001	-.078(**)	-0.041	-.108(**)	0.019
36 Service	.049(*)	-.053(*)	-.119(**)	-.096(**)	0.031
37 Prod/oper/repair	0.023	-.057(**)	-.134(**)	-.121(**)	-.053(*)

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

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Table 2: Correlation Matrix (cont.)

	6	7	8	9	10
1 Stress					
2 Std Job Demands					
3 Autonomy					
4 Skill Discretion					
5 Coworker Support					
6 Ethnic Similarity	1				
7 Gender Similarity	.125(**)	1			
8 Age Similarity	.084(**)	.069(**)	1		
9 Gender (male=1)	-.045(*)	-0.020	-0.014	1	
10 Age	.057(**)	-0.010	-.080(**)	-.086(**)	1
11 White	.388(**)	0.003	.044(*)	-0.015	.109(**)
12 African American	-.268(**)	-0.015	-0.032	-0.015	-.062(**)
13 Native American	-.057(**)	0.040	-.061(**)	0.004	0.001
14 Asian American	-.168(**)	0.010	-0.007	0.006	-0.025
15 Other races	-.186(**)	-0.004	-0.007	0.036	-.082(**)
16 > Highschool	-0.012	-0.003	-0.037	.095(**)	-.070(**)
17 Highschool grad	0.010	.075(**)	0.025	0.014	-0.015
18 Some college	-0.035	-0.002	0.032	-0.013	-.047(*)
19 Associate degree	0.001	-0.031	0.009	-0.004	0.017
20 Bachelor degree	0.024	-0.020	-0.032	-.078(**)	0.005
21 Grad or prof degree	0.011	-.055(*)	-0.012	0.013	.137(**)
22 Married & Partner	.088(**)	0.014	0.036	.059(**)	.188(**)
23 Single	-.086(**)	-0.024	-0.018	.055(*)	-.430(**)
24 Divor/Widow/Separat	-0.023	0.008	-0.028	-.136(**)	.214(**)
25 Have children	.060(**)	.059(**)	.070(**)	-.066(**)	.314(**)
26 Have elder people	0.011	0.016	-0.004	-0.004	.111(**)
27 Supervisor Support	.087(**)	-0.001	0.023	-.044(*)	0.019
28 Job tenure	.051(*)	0.038	0.010	.046(*)	.467(**)
29 Hours per week	-0.031	0.008	0.018	.247(**)	0.014
30 Job insecurity	-.099(**)	-0.029	-0.035	0.035	-.076(**)
31 Exectives	-0.015	-0.039	-0.006	-0.037	.092(**)
32 Professional	.058(**)	-0.007	-0.013	-.113(**)	0.036
33 Tech	-0.034	0.010	0.009	-0.014	0.026
34 Sales	0.040	.044(*)	0.013	-.055(*)	-0.025
35 Administrative	-0.011	-.083(**)	-0.002	-.214(**)	0.017
36 Service	-.046(*)	0.008	0.040	-0.014	-.097(**)
37 Prod/oper/repair	-0.002	.064(**)	-0.024	.356(**)	-0.040

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

Table 2: Correlation Matrix (cont.)

	11	12	13	14	15	16
1 Stress						
2 Std Job Demands						
3 Autonomy						
4 Skill Discretion						
5 Coworker Support						
6 Ethnic Similarity						
7 Gender Similarity						
8 Age Similarity						
9 Gender (male=1)						
10 Age						
11 White	1					
12 African American	-.678(**)	1				
13 Native American	-.171(**)	-0.027	1			
14 Asian American	-.248(**)	-0.039	-0.010	1		
15 Other races	-.573(**)	-.091(**)	-0.023	-0.033	1	
16 > Highschool	-.101(**)	.104(**)	-0.027	-0.039	.061(**)	1
17 Highschool grad	0.010	-0.025	0.005	-.045(*)	0.032	-.210(**)
18 Some college	-.045(*)	.056(**)	0.039	0.007	-0.010	-.169(**)
19 Associate degree	0.036	-0.016	-0.027	-0.029	-0.014	-.106(**)
20 Bachelor degree	.047(*)	-.053(*)	0.012	0.030	-0.029	-.163(**)
21 Grad or prof degree	.049(*)	-.056(**)	-0.026	.089(**)	-.043(*)	-.102(**)
22 Married & Partner	.087(**)	-.141(**)	0.035	0.019	0.009	0.008
23 Single	-.091(**)	.112(**)	-0.039	0.017	0.014	-0.012
24 Divor/Widow/Separat	-0.017	.065(**)	-0.004	-.042(*)	-0.027	0.002
25 Have children	-0.036	.054(*)	0.021	-0.025	-0.003	0.021
26 Have elder people	0.038	-0.022	-0.015	-.047(*)	-0.006	0.025
27 Supervisor Support	0.034	-0.040	0.002	-0.018	0.002	0.002
28 Job tenure	.074(**)	-.060(**)	0.029	-0.017	-.046(*)	-.126(**)
29 Hours per week	-0.029	0.018	0.007	0.011	0.016	-0.037
30 Job insecurity	-.075(**)	.087(**)	-0.035	-0.007	0.028	.114(**)
31 Exectives	0.008	-0.008	0.017	-0.015	-0.002	-.084(**)
32 Professional	.076(**)	-.075(**)	-0.006	.046(*)	-.049(*)	-.144(**)
33 Tech	0.007	-0.014	-0.017	0.002	0.010	-0.024
34 Sales	0.009	-0.014	-0.026	0.017	0.003	-0.018
35 Administrative	-0.026	.045(*)	0.018	0.004	-0.019	-.119(**)
36 Service	-0.038	.050(*)	-0.012	-0.007	0.007	.125(**)
37 Prod/oper/repair	-0.031	0.008	0.012	-0.039	.052(*)	.226(**)

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

Table 2: Correlation Matrix (cont.)

	17	18	19	20	21
1 Stress					
2 Std Job Demands					
3 Autonomy					
4 Skill Discretion					
5 Coworker Support					
6 Ethnic Similarity					
7 Gender Similarity					
8 Age Similarity					
9 Gender (male=1)					
10 Age					
11 White					
12 African American					
13 Native American					
14 Asian American					
15 Other races					
16 > Highschool					
17 Highschool grad	1				
18 Some college	-.343(**)	1			
19 Associate degree	-.214(**)	-.172(**)	1		
20 Bachelor degree	-.330(**)	-.266(**)	-.166(**)	1	
21 Grad or prof degree	-.206(**)	-.165(**)	-.103(**)	-.159(**)	1
22 Married & Partner	-0.008	-.062(**)	0.017	0.035	0.026
23 Single	0.030	.044(*)	-.052(*)	-0.014	-0.026
24 Divor/Widow/Separat	-0.021	0.034	0.033	-0.031	-0.007
25 Have children	-0.001	0.006	0.029	-0.034	-0.009
26 Have elder people	-.071(**)	0.014	0.013	0.001	.053(*)
27 Supervisor Support	0.007	-0.038	0.006	0.018	0.009
28 Job tenure	-0.002	-0.014	0.030	0.011	.106(**)
29 Hours per week	-0.040	-.053(*)	0.012	.046(*)	.101(**)
30 Job insecurity	-0.020	0.027	0.010	-.049(*)	-.064(**)
31 Exectives	-.116(**)	-0.005	0.012	.146(**)	.060(**)
32 Professional	-.245(**)	-.148(**)	0.031	.270(**)	.339(**)
33 Tech	-.075(**)	0.026	.104(**)	0.016	-0.023
34 Sales	.068(**)	-0.016	-0.019	-0.013	-0.029
35 Administrative	.048(*)	.120(**)	0.000	-0.027	-.091(**)
36 Service	.089(**)	0.024	-0.041	-.112(**)	-.104(**)
37 Prod/oper/repair	.202(**)	0.026	-.051(*)	-.256(**)	-.177(**)

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

Table 2: Correlation Matrix (cont.)

	22	23	24	25	26
1 Stress					
2 Std Job Demands					
3 Autonomy					
4 Skill Discretion					
5 Coworker Support					
6 Ethnic Similarity					
7 Gender Similarity					
8 Age Similarity					
9 Gender (male=1)					
10 Age					
11 White					
12 African American					
13 Native American					
14 Asian American					
15 Other races					
16 > Highschool					
17 Highschool grad					
18 Some college					
19 Associate degree					
20 Bachelor degree					
21 Grad or prof degree					
22 Married & Partner	1				
23 Single	-.662(**)	1			
24 Divor/Widow/Separat	-.601(**)	-.201(**)	1		
25 Have children	.354(**)	-.520(**)	.093(**)	1	
26 Have elder people	0.036	-.049(*)	0.005	0.019	1
27 Supervisor Support	0.003	0.023	-0.028	-0.003	-0.041
28 Job tenure	.135(**)	-.213(**)	.052(*)	.144(**)	.072(**)
29 Hours per week	.084(**)	-.088(**)	-0.015	.078(**)	0.004
30 Job insecurity	-.071(**)	.068(**)	0.021	-0.042	0.036
31 Exectives	0.035	-.044(*)	0.001	0.024	0.013
32 Professional	.064(**)	-0.041	-0.040	0.014	0.014
33 Tech	0.011	0.005	-0.019	-0.012	0.019
34 Sales	-.058(**)	.049(*)	0.023	-0.009	-0.018
35 Administrative	-.048(*)	0.017	.045(*)	-.046(*)	-0.005
36 Service	-.068(**)	.070(**)	0.014	-0.026	-0.021
37 Prod/oper/repair	0.041	-0.030	-0.021	0.036	0.003

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

Table 2: Correlation Matrix (cont.)

	27	28	29	30	31
1 Stress					
2 Std Job Demands					
3 Autonomy					
4 Skill Discretion					
5 Coworker Support					
6 Ethnic Similarity					
7 Gender Similarity					
8 Age Similarity					
9 Gender (male=1)					
10 Age					
11 White					
12 African American					
13 Native American					
14 Asian American					
15 Other races					
16 > Highschool					
17 Highschool grad					
18 Some college					
19 Associate degree					
20 Bachelor degree					
21 Grad or prof degree					
22 Married & Partner					
23 Single					
24 Divor/Widow/Separat					
25 Have children					
26 Have elder people					
27 Supervisor Support	1				
28 Job tenure	-0.002	1			
29 Hours per week	-.087(**)	.096(**)	1		
30 Job insecurity	-.255(**)	-.115(**)	-0.002	1	
31 Exectives	0.015	.060(**)	.076(**)	-0.039	1
32 Professional	0.033	.089(**)	.058(**)	-.047(*)	-.205(**)
33 Tech	-0.020	.044(*)	-0.022	-0.037	-.084(**)
34 Sales	0.036	-.085(**)	-.070(**)	0.000	-.128(**)
35 Administrative	0.022	0.000	-.108(**)	-0.006	-.165(**)
36 Service	0.005	-.079(**)	-.108(**)	.053(*)	-.151(**)
37 Prod/oper/repair	-.078(**)	-0.034	.104(**)	.058(**)	-.240(**)

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

Table 2: Correlation Matrix (cont.)

	32	33	34	35	36	37
1 Stress						
2 Std Job Demands						
3 Autonomy						
4 Skill Discretion						
5 Coworker Support						
6 Ethnic Similarity						
7 Gender Similarity						
8 Age Similarity						
9 Gender (male=1)						
10 Age						
11 White						
12 African American						
13 Native American						
14 Asian American						
15 Other races						
16 > Highschool						
17 Highschool grad						
18 Some college						
19 Associate degree						
20 Bachelor degree						
21 Grad or prof degree						
22 Married & Partner						
23 Single						
24 Divor/Widow/Separat						
25 Have children						
26 Have elder people						
27 Supervisor Support						
28 Job tenure						
29 Hours per week						
30 Job insecurity						
31 Exectives						
32 Professional	1					
33 Tech	-.104(**)	1				
34 Sales	-.159(**)	-.065(**)	1			
35 Administrative	-.204(**)	-.083(**)	-.128(**)	1		
36 Service	-.187(**)	-.076(**)	-.117(**)	-.150(**)	1	
37 Prod/oper/repair	-.298(**)	-.122(**)	-.186(**)	-.239(**)	-.219(**)	1

** = Correlation is significant at the 0.01 level (2-tailed).
*= Correlation is significant at the 0.05 level (2-tailed).
Lstwise N=2145

Job Characteristics as Mediators

As discussed in the previous chapter, multiple regression analysis is the most appropriate method for analyzing the relationship between a single dependent variable and several independent variables. Tables 3-5 below show the results of the three steps taken for detecting the mediating effects of job characteristics on the relationship between coworker support and stress. The three steps correspond to the three conditions described in the previous chapter, which must be held to establish mediation (David. P. MacKinnon, 1994). First, the independent variable (coworker support) must be statistically significant for the dependent variable (stress); second, the independent variable must be statistically significant for the mediators variables (job demands, autonomy and skill discretion); third and finally, the independent variable should decrease in magnitude when three mediators are present in the same regression equation.

Results of the multiple regression analyses are organized in the following way. Table 3 provides the results of the first regression equation, in which stress is regressed on coworker support. This equation also corresponds to a sub-hypothesis, Hypothesis 1a, proposing that coworker support is negatively associated with stress. Table 4 shows the results of the second equation, in which job characteristics are regressed on coworker support, in order to examine the mediating effect of job characteristics. Since the proposed model of this dissertation includes three job characteristics, there are three equations for each mediator variable. These equations also correspond to three sub-hypotheses, Hypothesis 1b, 1c, and 1d, stating, respectively, that coworker support is negatively associated with job demands, while coworker support is positively associated

with autonomy/skill discretion. Column 3 in Table 5 provides the results of the third

equation, in which stress is regressed not only on coworker support but also on the three

job characteristics. This equation is for examining the third condition, and corresponds to

Hypothesis 1e, proposing that the relationship between coworker support and stress

becomes statistically insignificant when job characteristics are controlled.

Note that all tables (Tables 3-5) exhibiting regression results include an additional

set of columns named 'condensed,' in which coefficients and standard errors of variables

for the SEM analyses are listed. As described in the previous chapter, some control

variables are condensed to a single dummy variable for the SEM analyses in order to

identify the proposed model. The purpose of presenting the results with the condensed

control variables is to show that the results do not differ between the two versions (e.g.,

original and condensed), which is important for comparing the results from the multiple

regressions and the SEM analysis.

Table 3 shows the result of the first equation. The coefficient of coworker

support is -.181 (-.177 for the condensed version) with significance level less than 0.01

(0.01 for the condensed version), which indicates that the coworker support variable has a

negative and statistically significant association with stress. This result indicates that

having higher support from coworkers is associated with lower individual stress levels.

Accordingly, the result supports Hypothesis 1a that coworker support is significantly

associated with an individual's stress.

Table 3: Regression Results of Stress on Coworker Support

DV= stress			DV = stress		
Variables (original)	Coeff	Std. Error	Variables (condensed	Coeff	Std. Error
Gender (male=1)	-0.225	0.034 **	Gender (male=1)	-0.214	0.032 **
Age	-0.009	0.002 **	Age	-0.009	0.001 **
African American	-0.131	0.053 *	Dummy White	0.094	0.039 *
Native American	-0.191	0.171			
Asian American	-0.048	0.127			
Other races	-0.087	0.059			
> Highschool	0.255	0.058 **	Dummy > Bachelor	-0.091	0.039 *
Some college	-0.095	0.043 *			
Associate degree	-0.136	0.057 *			
Bachelor degree	-0.117	0.049 *			
Grad or profes degree	-0.158	0.066 *			
Single	0.120	0.050 *	Dummy Mar & Par	-0.119	0.035 **
Divor/Widow/Sep	0.138	0.044 **			
Have children	0.162	0.039 **	Have children	0.166	0.037 **
Have elder people	0.025	0.032	Have elder people	0.027	0.032
Supervisor Support	-0.196	0.029 **	Supervisor Support	-0.191	0.029 **
Job tenure	0.001	0.002	Job tenure	0.000	0.002
Hours per week	0.002	0.001	Hours per week	0.001	0.001
Job insecurity	0.110	0.017 **	Job security	0.119	0.017 **
OCC exectives	0.025	0.058	Dummy Ocup	-0.031	0.037
OCC professional	-0.013	0.056	(1 = manager)		
OCC tech	-0.024	0.084			
OCC sales	0.027	0.064			
OCC service	0.018	0.060			
OCC prod/oper/repair	-0.016	0.054			
Coworker Support	-0.181	0.029 **	Coworker Support	-0.177	0.030 **
(Constant)	3.726	0.148 **	(Constant)	3.699	0.140 **
R-squared	0.166		R-squared	0.153	
N	2,184		N	2,175	

Table 4 shows the results of the second equation in which the three mediator variables (job characteristics) are regressed on the independent variable (coworker support). The first pair of columns represents the results of regressing job demands on

coworker support. As the results indicate, the coefficient on coworker support is -.065 (-.068 for the condensed) at a significance level of 0.026 (0.020 for the condensed), indicating that having higher support from coworkers is more likely to be associated with a reduced level of perception of job demands. The second set of columns presents the results of regressing autonomy on coworker support. Contrary to job demands, coworker support has a positive association with autonomy (coefficient is .107 at a significance level of 0.000 for the original, and coefficient is .091 at a significance level of 0.002 for the condensed). The results indicate that having coworker support is more likely to increase the perception of autonomy. Similar results are identified for skill discretion; as shown in the last set of columns in Table 4, the coefficient of coworker support on skill discretion is .231 (.237 for the condensed) at a significance level less than 0.001 (less than 0.001 for the condensed). This indicates that having coworker support is more likely to increase positive perceptions of an individual's skill discretion. The above findings support Hypothesis 1b, 1c, and 1d, and therefore meet the second condition that the independent variable must be statistically significant with the mediator variables.

Table 4: Regression Results of Three Job Characteristics (Mediators) on Coworker Support

	DV= Job demands		DV=Autonomy		DV=Skill discretion	
	Original	Condensed	Original	Condensed	Original	Condensed
Coworker	-0.065 *	-0.068 *	0.107 **	0.091 **	0.231 **	0.237 **
	(0.029)	(0.029)	(0.029)	(0.029)	(0.022)	(0.022)
(Constant)	0.129 **	0.033	0.629 **	0.583 **	0.882 **	0.940 **
	(0.145)	(0.138)	(0.142)	(0.137)	(0.109)	(0.104)
R-squared	0.204	0.200	0.268	0.236	0.369	0.351
N	2,196	2,187	2,196	2,187	2,196	2,187

Standard Error in parenthesis.

Control variables are not shown in the table.

$*<0.05$, $**<0.01$

Table 5 consists of three columns for both original and condensed regressions using stress as the dependent variable. The first columns (Column 1 of the original and the condensed) show the coefficient of coworker support when it is used as a solitary control variables. The second columns represent results from the regression in which stress is regressed on job characteristics and other control variables, but without coworker support. The third columns are the results of the regressions with all variables: controls, job characteristics, and coworker support.

**Table 5: Regression Results of Stress on Coworker Support,
Job Characteristics, and
Both Coworker Support and Job Characteristics**

	Original (DV=stress)			Condensed (DV=stress)		
	Column 1	Column 2	Column 3	Column 1	Column 2	Column 3
Job Demands	-	0.187 **	0.181 **	-	0.192 **	0.187 **
		(0.022)	(0.022)		(0.022)	(0.022)
Skill Discretion	-	-0.064 *	-0.031	-	-0.068 *	-0.037
		(0.029)	(0.029)		(0.028)	(0.029)
Autonomy	-	-0.07 **	-0.06 **	-	-0.08 **	-0.073 **
		(0.023)	(0.023)		(0.022)	(0.022)
Coworker Support	-0.181 **	-	-0.153 **	-0.177 **	-	-0.145 **
	(0.029)		(0.030)	(0.030)		(0.030)
R-squared	0.166	0.185	0.194	0.153	0.176	0.184
N		2,184			2,175	

Standard Error in parenthesis.

Control variables are not shown in the table.

* < 0.05, ** < 0.01

For meeting the third condition required for a mediating relationship, first of all, job characteristics must be significantly associated with stress. In both the original and condensed regressions, the coefficients of all job characteristics show statistical significance (see Column 2 of the original and the condensed): coefficient = .187 (.192 for condensed) at a significance level of less than 0.001 (less than 0.001 for condensed) for job demands; coefficient = -.064 (-.068 for the condensed) at a significance level of 0.025 (0.016 for the condensed) for skill discretion; coefficient = -.070 (-.080 for the condensed) at a significance level of 0.002 (less than 0.001 for the condensed) for autonomy.

When including these job characteristics, the coefficients of coworker support decrease in value from -.181 (-.177 for the condensed) in Column 1 to -.153 (-.145 for the

condensed) in Column 3. As introduced in the previous chapter, the mediating effect can be expressed in the following formula (MacKinnon, 2000):

Formula 4: Mediated effect = r – r'

where r represents the coefficient of coworker support in Fomula 1 (see Methods chapter) where no job characteristics are present in the equation (-.181 for the original and -.177 for the condensed) and r' represents the coefficient of coworker support in Fomula 3 where job characteristics variables are present in the equation (-.153 for the original and -.145 for the condensed). The mediating effect of three job characteristics is therefore -0.181 – (-0.153) = -0.028 (for the condensed: -.171-(-.145) = 0.032). Since coworker support still shows statistical significance (see Column 3 in Table 3) even with the presence of job characteristics, job characteristics partially, but not fully, mediate the relationship between coworker support and stress.

There is a post-hoc test of an approximate significance of a mediating effect, called the Sobel test (Baron & Kenny, 1986). As presented in Figure 6 below, the path from the independent variable to the mediator is denoted as a and its standard error is s_a; the path from the mediator to the dependent variable is denoted as b and its standard error is s_b.
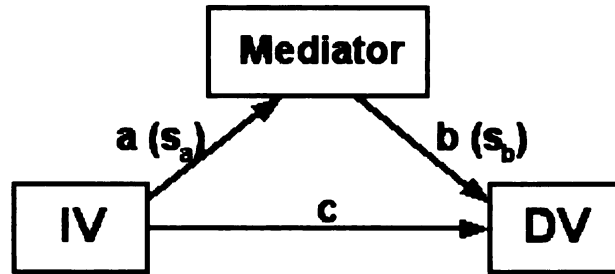
Figure 6: Mediating Paths

The approximate significance is calculated based on the following formula:

$$\text{z value} = \frac{a * b}{\sqrt{(b^2 * sa^2 + a^2 * sb^2 + sa^2 * sb^2)}}$$

Table 6 shows the results of the Sobel Test for each job characteristic variable. Job demands and autonomy show a statistically significant mediating effect on the relationship between coworker support and stress, while skill discretion does not demonstrate a statistically significant mediating effect.

Table 6: Results of the Sobel Test for the Significance of the Mediating Effects of Job Characteristics

Job Demands		Autonomy		Skill Discretion	
a	-0.065	a	0.107	a	0.231
sa	0.029	sa	0.029	sa	0.022
b	0.181	b	-0.060	b	-0.031
sb	0.022	sb	0.023	sb	0.029
Z =	-2.148 **	Z =	-2.080 *	Z =	-1.059

* <0.05, ** < 0.01

In short, the results described above lead to the conclusion that job characteristics partially mediate the relationship between coworker support and stress which, in part, supports Hypothesis 1 (overall). More specifically, job demands and autonomy in the proposed model partially mediate the relationship between coworker support and an individual's stress, but skill discretion does not mediate the relationship. Note that the variance-inflation factors (VIF) diagnostics (available from the author) for each regression analysis indicate that there are some levels of collinearity among the independent and mediator variables, but they are not serious enough to eliminate variables from the entire analyses.

Demographic similarity

Table 7 shows the results of the regression estimates in which coworker support is regressed on three demographic similarity variables: ethnic, gender and age similarity. Note that no other control variable is included in the regression equation. The coefficient of ethnic similarity is .126 with significance level at less than 0.01. Gender similarity fails to be statistically significant, however (coefficient = .037 at a significance level of 0.240). Age similarity demonstrates marginal statistical significance (coefficient = 0.050 at a significance level of 0.051). In addition, the R-squared value suggests that less than 1 percent of variance in coworker support can be explained by the three demographic similarity variables. In short, these results only partially support Hypothesis 2 that demographic similarity is significantly associated with coworker support; only ethnic similarity shows a significant association with coworker support.

**Table 7: Regression Results of Coworker Support
on Demographic Similarity**

DV= Coworker Support		
	Coef	Std. Error
Ethnic Similarity	0.126	0.029 **
Gender Similarity	0.037	0.031
Age Similarity	0.050	0.026
(Constant)	3.268	0.037 **
R-squard	0.009	
N	2,693	

Control variables are not included in the equation.
* > 0.05, ** > 0.01

Results of Structural Equation Modeling

Model Identification

Before conducting SEM analyses, the proposed model has to satisfy a requirement

for model identification. To check the necessary conditions for model identification, a

calculation is performed to count the number of independent parameters in the model and

subtract them from the number of non-redundant elements in the sample covariance

matrix. The product of the calculation represents the 'degree of freedom.'

Degree of freedom = p (p + 1) / 2 − (number of model parameters)

where p is the number of observed variables to which the model is fitted (Raykov &

Marcoulides, 2006). The model parameters in the proposed model are calculated based

on (1) the variance and covariance of the exogenous latent factors, measurement errors,

and disturbances, (2) the direct effects on the indicators from factors (e.g., factor loading),

and (3) the direct effects on latent endogenous factors from other factors (e.g., path

coefficients). The model parameter is therefore:

$$119 + 5 + 7 + 15 = 146$$

The degree of freedom of the proposed model is:

$$\text{Degree of freedom (df)} = (20 * 21) / 2 - 146 = 63$$

Since the degree of freedom is nonnegative, the proposed model meets the requirement

for identification called the "t-rule" (Raykov & Marcoulides, 2006).

Fit Indices

As mentioned in the previous chapter, the purpose of using structural equation

modeling (SEM) is to examine the overall fit of the proposed model. Figure 6 shows the

t-value of each path coefficient of the model. In fact, the predicted outcomes of the

relationships among demographic similarity, coworker support, job characteristics, and

stress are quite similar to the predicted outcomes obtained from the multiple regression

estimates. For example, the t-values of the path coefficients for gender and age similarity

are not significant (t = .75 for gender, t = .54 for age). Coworker support demonstrates

both a direct effect and an indirect effect through job characteristics (t = -4.97 for the

direct effect of coworker support). Also, the relationship between skill discretion and

stress is non-significant (t = -.161) when coworker support is controlled. As shown in

Figure 6, gender and age similarity did not show a significant relationship with coworker

support. Similar to the results from the multiple regression estimates, several control

variables, including race, having elderly people to care for at home, job tenure, work

hours, and occupation also did not show significant relationship with stress.   The

three fit indices, the chi-square, the comparative fit index (CFI), and the root-mean-

square error of approximation (RMSEA), are used to examine the theoretical fit of the

model. The fit indices however showed a significantly poor fit of the proposed model

(Chi-square = 1854.91, CFI = 0.72, and RMSEA = 0.12), despite the similar results

regarding the significance of the path coefficients with those of regression analyses.

Reasons for the unsatisfactory fit of the proposed model are discussed in the next chapter.

32.56	→	Ethnic di	3.29
32.56	→	Gender di	0.75
32.56	→	Age di	0.54
32.56	→	Gender	-5.53
32.56	→	Age	-5.84
32.56	→	Race	1.89
32.56	→	Edu	-2.52
32.56	→	Married	-3.61
32.56	→	Children	4.58
32.56	→	Eldery	0.45
32.56	→	Supervi	-4.96
32.56	→	Tenure	-0.13
32.56	→	W Hours	-0.44
32.56	→	J Security	5.48
32.56	→	Occupat	-0.81

Cow Sup ← 32.56

-8.38

Job Dem ← 32.56

13.69

Autonom ← 32.56

19.03

Skill Disc ← 32.5

9.00

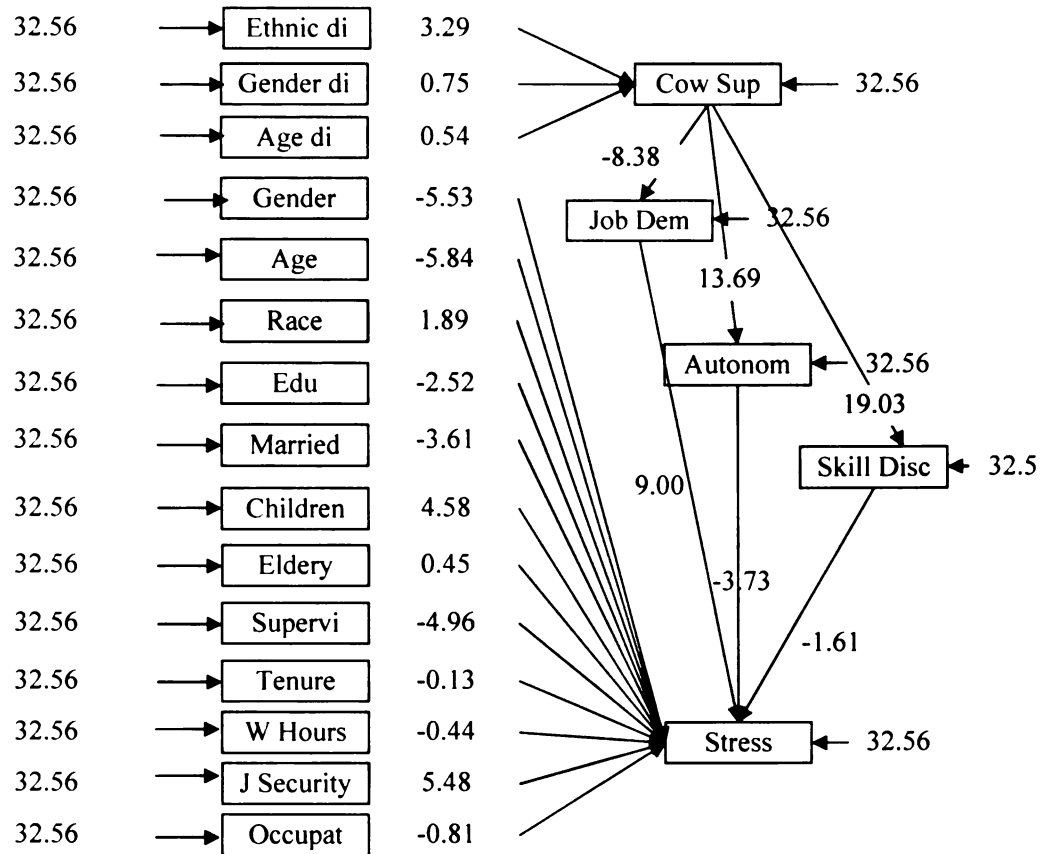-3.73

-1.61

Stress ← 32.56

Figure 7: The results of the SEM analyses for the proposed Model

CHAPTER 7: DISCUSSION

Discussion of the Results

This dissertation proposed a theoretical model that was developed based on two well-known theories, the Social Information Processing (SIP) approach and the Demand-Control (D-C) model, to examine the relationship among demographic similarity, coworker support, job characteristics, and an individual's stress. In the proposed model, coworker support was considered a social cue that individual workers receive from their work environment. The effect of coworker support was then explained by the SIP approach, which proposes that individuals' perceptions are constructed by the social environment or by the network of social and informational relationships. Such socially-constructed job characteristics in turn are predicted to affect the level of an individual's stress. The effects of job characteristics on stress were explained by the D-C model, which proposed that job demands and job control (consisting of autonomy and skill discretion) were critical determinants of individuals' stress levels. Finally, the model proposed possible antecedents of coworker support: demographic similarity in terms of age, gender, and ethnic background. The relationship between demographic similarity and coworker support was explained by the similarity-attraction paradigm, which was treated as part of the SIP approach. By integrating the D-C model and the SIP approach, the proposed model tested the main hypothesis (Hypothesis 1) that job characteristics mediate the relationship between coworker support and an individual's stress.

As predicted in a set of sub-hypotheses in Chapter 5 (e.g., Hypothesis 1a through 1d), coworker support showed a significant association with stress as well as three job characteristics: job demands, autonomy and skill discretion (see Table 3 and 4 in Chapter

6). These results may support the notion that coworker support is one of the social cues that affect individuals' perceptions of job characteristics.

The coefficient of coworker support decreased in value when three job characteristics were present in the same regression equation (see Table 5 in Chapter 6), but the strength of its direct effect on stress remained statistically significant. This result partially supports the Hypothesis 1e, which proposed that coworker support would lose its statistical significance when job characteristics were present in the same equation. This result also indicates that job characteristics partially, but not fully, mediate the relationship between coworker support and stress. The statistical significance of the partial mediating effects were confirmed by the results from the Sobel test regarding job demands and autonomy.

All three job characteristics showed a significant association with stress when coworker support was not present in the equation (see Column 2 in Table 5). However, skill discretion lost its significance when coworker support was present in the regression equation. This indicates that the variance in skill discretion may be shared in large part with coworker support, though the conceptual distinctiveness between coworker support and skill discretion was methodologically confirmed by factor analyses. In addition, the variance inflation factor of the regression analyses did not indicate serious multicollinearity for these variables. However, job demands, autonomy and skill discretion showed high correlations with each other (see Table 2 in Chapter 6), which may lead to instability of the estimation regarding the relationship among variables.

Based on the above arguments, the findings from the multiple regression analyses partially support the main hypothesis (Hypothesis 1), stating that job characteristics

mediate the relationship between coworker support and an individual's stress. The term *partially* indicates the lack of statistical significance of skill discretion as a mediator on the relationship between coworker support and stress.

Hypothesis 2 states that demographic similarity affects the level of coworker support. The result from the multiple regression analysis, however, only supported this hypothesis for ethnic background, which seems contradictory to previous findings. Such an insignificant relationship between age/gender similarity and coworker support may result from the nature of the measurement. In fact, scales for the similarity items are difficult to use directly for a quantitative purpose, since they do not have equal intervals, even though each scale is assigned to a range of percentages (see Appendix A for detail). Consequently, these three items were treated as dummy variables in the multiple regression equations, which lost considerable variance among survey participants. Variables with better scales would have helped obtain better results.

Although the results from the multiple regression analyses generally support the main hypothesis (Hypothesis 1), the structural equation modeling (SEM) did not support the model from a 'theoretical fit' standpoint. The overall fit indices, such as chi-square, RMSEA, and CFI, indicated a poor fit. The following sub-section discusses possible reasons for the discrepancies between the results from the multiple regression analyses and that of the SEM analyses, as well as reasons for the poor fit of the model.

Reasons for the Poor Fit

As described in the method chapter, the major difference between multiple regression analysis and SEM analysis is that SEM analysis provides a mechanism for taking measurement error into account for both dependent and independent variables

(Raykov & Marcoulides, 2006). In contrast, multiple regression analyses do not consider potential measurement error of independent variables. Since the independent and mediator variables of the proposed model are perceptions of support and job characteristics, they are highly likely to contain measurement error.

In addition, as shown in the correlation matrix (Table 2 in Chapter 6), coworker support, job characteristics, and stress are highly correlated variables despite being theoretically distinctive. These high correlations may result from the cross-sectional nature of the data set. In fact, all the information to develop dependent, independent, and mediator variables were collected at a single point in time from a single source. Using the same source for both dependent and independent variables may posses some potential flaws, such as the risk of method variance (Jenkins, Nadler, Lawler, & Cammann, 1975). Common method variance is a form of systematic error contamination due to the method of measurement rather than the trait (Charles A. O'Reilly, Parlette, & Bloom, 1980). The primary problem associated with using common methods is the overlap of the method constructs, which is especially problematic when respondents associate the dimensions of one variable while answering another. Such measurement error may make the regression results different from that of the SEM analyses.

The reliability of measures used in this dissertation may have contributed to the less-than-satisfactory SEM results. For instance, coworker support, job demands, autonomy, and skill discretion are acceptable, but not highly reliable variables (alphas between 0.70 and 0.80). In terms of the dependent variable (stress), the reliability is even lower than other variables (alpha = 0.61). Since the dataset is not designed for this particular study, these composite variables do not necessarily consist of all items that are

suggested in the previous studies, which is part of the weakness of using a secondary dataset.

In addition, this dissertation did not differentiate emotional support from instrumental support of coworkers, but emotional and instrumental support may affect individuals' stress differently. For example, emotional social support may contribute more to developing a sense of stability in one's life situation, which would affect job demands more than autonomy and skill discretion. On the other hand, instrumental support, such as practical advice and survival tips in the workplace, may contribute more to developing a sense of predictability, which would affect autonomy and skill discretion more than job demands. If this is true, the combined measure of social support may affect specification error of the SEM analysis.

As mentioned in the method chapter, the dependent variable of the proposed model consists of items called 'global measurement of stress,' which asks the overall stress level of individuals in their life as a whole. Using this variable for the analyses should be advantageous for this dissertation from a 'common-method variance' standpoint, since, unlike more work-related outcomes (e.g., occupational stress), the survey participants would be less likely to associate their job characteristics perceptions with their stress level. Also, they would be less likely to associate their evaluation of coworker support with stress. However, this global stress measure may not be explained by workplace factors such as coworker support and job characteristics. Additional work-related variables such as occupational stress, job satisfaction, and work-family conflict would have been better explained by the proposed independent and mediator variables.

<u>Future Research</u>

Several issues are pointed out for future research. First, this dissertation examined a US sample. US society is usually considered an individualistic society where priority is placed on self-reliance and personal well-being (Hofstede, 1980). People in such a society focus more on individual goals and personal attributes. People in collectivistic societies, on the other hand, give more priority to group goals welfare. They also put more emphasis on group identities, harmony, and cooperation (Hofstede, 1980). When comparing people in individualistic societies with collectivistic societies, the magnitude of the coworker effect may be more significant in collectivistic societies. In other words, social cues, such as support form coworkers, may have more impact on individuals' perception of job characteristics in a collectivistic workplace than in an individualistic workplace. Future research on coworker support should include factors such as cultural differences (e.g., individualistic vs. collectivistic) that may affect individuals' perception of their job characteristics, which may consequently influence their stress levels.

Second, this dissertation focused on coworker support and intentionally excluded supervisor support, but it did not address theoretical differences nor did it test the difference empirically. There may be explanations to support the difference between coworker and supervisor support. For example, workers may use coworker support as a reference point to build their perceptions of job characteristics. In other words, workers interpret their work environment by observing their colleagues. In such cases, coworker support is an antecedent of job characteristics. In contrast, workers may see supervisor support as encouragement to adjust their perceptual association of job characteristics with

stress. In this case, social support from supervisors is not an antecedent, but a moderator that changes the strength of a stressor-strain relationship. Future research is necessary to find a theoretical rationale to explain the difference between supervisor and coworker support in terms of how individuals understand and interpret such support.

Finally, the dataset used in this dissertation consists of a nationally representative sample of working adults. Using a nationally representative sample has strength in allowing the generalizing the empirical findings. However, large heterogeneous samples may include the confounding effects of socio-economic status (Cappelli & Sherer, 1991; Clegg, 1984; de Rijk et al., 1998; Morgeson & Campion, 2003; Parker et al., 2001). Analyses for specific groups of people, in addition to analyses with a whole sample, may overcome the weakness of using large representative samples. The analyses for specific groups of people may also help refine the effect of job demands, autonomy and skill discretion. Future studies should therefore investigate theoretical foundations for grouping people within a representative sample.

Contributions of the Study

Although the overall fit indices of the SEM analyses showed unsatisfactory results, the findings from the regression analyses at least support the notion that coworker support may affect perceptions of job characteristics, which consequently affect individuals' stress level. Instead of focusing on the moderating/buffering effect of social support, this dissertation proposed that social support was an antecedent of stressors (e.g., job characteristics). In other words, social support is a social cue from the environment, which can be explained by the Social Information Processing (SIP) approach. The

empirical results generally confirmed the role of coworker support as an antecedent of job characteristics, as well as the role of job characteristics as mediators. In this regard, the proposed model explained 'conceptually *and* methodologically' the effect of coworker support on an individual's stress. This finding provides a solution for the considerable debate over *how* social support affects an individual's stress.

As mentioned in the previous chapters, studies of job characteristics have often been criticized for failing to reflect on factors that influence and constrain individuals' perceptions of job characteristics (Cappelli & Sherer, 1991; Rousseau, 1978). Salancik and Peffer (1978) argued that there have been few attempts to explore social/situational (rather than dispositional) factors as an alternative explanation for work attitudes and behaviors. This dissertation introduced social support from coworkers as a social cue, and the results showed that this does affect individuals' perceptions of job characteristics. In recent years, research interest in job characteristics appears to be declining (Morgeson & Campion, 2003). However, by expanding and broadening the focus of a job characteristics paradigm, this dissertation provides a way of revitalizing the research on job characteristics. In fact, some researchers have tried to consider a job characteristics theory in a larger context, and obtained evidence of a potential mediating effect of job characteristics. Piccolo and Coloquitt (2006) found that transformational leadership was associated with the way individuals view their jobs, which in turn affected their performance and organizational citizenship behavior (OCB). By integrating a job characteristics theory with other well-established theory, this dissertation opens up a new domain for the potential mediating effect of job characteristics.

Implications

These results have several implications. First, individual workers in a contemporary workplace are required to have more interactions with their colleagues due primarily to structural and demographic changes in the workplace discussed in the previous chapter. While such interactions with coworkers may be a source of support, they may also become a potential source of stress (Piccolo & Colquitt, 2006). In other words, whether they are a source of stress or a source of social support depends on whether or not the environment facilitates positive interactions among coworkers. For example, organizations can develop a buddy system for on-the-job training in which senior workers are paired with new workers to teach knowledge and skills, as well as informal information (e.g., tips for dealing with a particular boss).

Management can also utilize existing systems such as Kaizen/Teian meetings for the purpose of promoting a supportive environment. Originally, such meetings were developed as a way to make suggestions for increasing productivity in a plant or an organization. However, these meetings can also be used for improving individuals' job skills and knowledge. In addition, specific off-the-job training, such as training for improving interpersonal skills, is an effective way to create positive interactions among workers. These implications can also be applicable to team building within an organization. Team members usually have more interactions than those not in a team setting. Particularly in a self-directed team, individual members may be significantly influenced by their team members since they are the dominant source of information for accomplishing their tasks. Under the circumstances, arranging a better structure/system that promotes interactions may facilitate access to practical as well as emotional support

from other team members. Such systematic efforts to promote both instrumental and affective networks among team members will enhance workers' affect and may consequently improve job performance.

Traditionally, studies of job characteristics have been analyzed by the 'need-satisfaction paradigm,' which emphasizes individuals' predisposition for explaining the effect of job characteristics (Morgeson & Campion, 2003). Consequently, these studies have looked to potentially expensive and time-consuming practices such as job enlargement or enrichment to promote and improve individuals' perception of job characteristics (Piccolo & Colquitt, 2006). However, the empirical results of this dissertation confirmed the notion that not only predisposition, but also social construction of information provided by coworkers could determine the perceptions of job characteristics (R. W. Griffin et al., 1987; Piccolo & Colquitt, 2006). Job design, therefore, could be improved by paying attention to the ethnic composition of workers, running training for interpersonal skills, or promoting cultural change within an organization (Parker et al., 2001).

Note, however, that the results of the analyses do not speak to a causal connection among coworker support, job characteristics, and stress given the nature of the data set used for the analyses. Therefore, the implications presented in this section rely on the assumption that the association among coworker support, job characteristic, and stress does represent a causal relationship.

Conclusion

The purpose of this dissertation was to explain the effect of coworker support on an individual's stress in both theoretical and methodological ways. By introducing job characteristics as mediators, the proposed model attempted to explain how coworker support affects an individual's stress. Although the empirical results from the analyses did not confirm a theoretical fit of the proposed model, they generally supported each of the theoretical relationships: demographic similarity and coworker support, coworker support and job characteristics, and job characteristics and stress. In other words, the results indicated that individuals' perceptions of job characteristics were partially constructed by coworker support. Job characteristics in turn affected an individual's stress level. In addition, ethnic similarity may affect the level of coworker support. These empirical findings suggest that creating supportive interactions among workers may not only reduce individuals' stress levels, but also have positive consequences for workers in terms of developing perceptions of job characteristics.

As mentioned previously, having a less stressed workforce is also beneficial for organizations. Stressed workers can lead to occupational accidents, legal challenges, and compensation for stress-related illness. In a situation where workers have more opportunities to work with their colleagues, maintaining positive social relations among workers will thus be the most critical and cost-effective way to create a win-win situation for both management and workers.

Appendices

APPENDIX A: Variable Descriptions and Methods of Construction

Variable Name	Descriptions and Method of Construction
Dependent Variable	
Stress	This variable consists of four questions. It is defined as the sum of the four items divided by 4. (Reverse coded: Alpha = 0.61.) * QPW3: How often have you felt nervous and stressed? * QPW4: How often have you felt that you were unable to control the important things in your life? * QPW5: How often have you felt confident about your ability to handle your personal problems? * QPW6: How often have you felt that things were going your way? (1 = very often, 2 = often, 3 = sometimes, 4 = rarely, 5 = never)
Independent Variables	
Coworker Support	This variable consists of three questions. It is defined as the sum of the three questions divided by 3. (Reverse coded: Alpha = 0.76.) * QWC27: I feel I am really a part of the group of people I work with. * QWC28a: I have the support from coworkers that I need to do a good job. * QWC28b: I have support from coworkers that helps me to manage my work and personal or family life. (1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree,4 = strongly disagree)
Mediator Variables	
Job Demands	This variable consists of five questions. It is defined as the sum of the four standardized items divided by 4. (Reverse coded: Alpha = 0.77.) * QWC12: I never seem to have enough time to get everything done on my job. (1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree,4 = strongly disagree) * QWC53: Thinking about your main job, tell me how often you have felt overwhelmed by how much you had to do at work in the last 3 months? * QWC54: And how often in the past 3 months, have you been asked by your supervisor or manager to do excessive amounts of work? * QWC56: During a typical workweek, how often do you have to work on too many tasks at the same time? (1 = very often, 2 = often, 3 = sometimes, 4 = rarely, 5 = never)

Job Control

Autonomy   This variable consists of four questions. It is defined as the sum of the four questions divided by 4. (Reverse coded: Alpha = 0.71.)
- QWC1: I have the freedom to decide what I do on my job.
- QWC4: It is basically my own responsibility to decide how my job gets done.
- QWC7: I have a lot of way about what happens on my job.
- QWC9: I decide when I take breaks.
  (1 = very true, 2 = somewhat true, 3 = a little true, 4 = not at all true)

Skill Discretion   This variable consists of three questions. It is defined as the sum of the four questions divided by 4. (Reverse coded: Alpha = 0.71.)
- QWC3: My job requires that I keep learning new things.
- QWC11: My job requires that I be creative.
- QWC13: My job lets me use my skills and abilities.
  (1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree, 4 = strongly disagree)
- QWC47: How true is the following statement about your job: I have the opportunity to develop my own special abilities.
  (1 = very true, 2 = somewhat true, 3 = a little true, 4 = not at all true)

Antecedent of coworker support

Demograhic Similarity

There are three single-item variables regarding similarity (ethnic background, age, and gender). They are recoded to 1-0 variable, indicating that 1 = more than 50% are similar / 0 = less than 50% are similar.

Ethnic similarity   * QWC43: About what percentage of your coworkers are of people from your racial, ethnic, or national

Gender similarity   * QWC43a: About what percentage of your coworkers are people of your sex?

Age similarity   * QWC43b: About what percentage of your coworkers are within 10 years of your age – either younger or older?
(1-100% of coworkers / 2-75 through 99% / 3-50 through 74% / 4-25 through 49% / 5-Less than 25% but more than 0 / 6-0%)

Control Variables

Working environment

Job experience   QEB38: How long have you worked for this employer/ been involved in this line of work?

Work hours   QEB38: How long have you worked for this employer/ been involved in this line of work?

Job insecurity	QEB37r: How likely is it that during the next couple of years you will lose your present job and have to look for a job with another employer? (1 = very likely, 2 = somewhat likely, 3 = not too likely, 4 = not al all likely: Reverse coded)
Occupations	Creating 7 dummy categories based on the 3 digit codes from US bureau of the census (occupat / oc80) Executive, administrative, and managerial occupations (003-037) Professional specialty occupations (042-199) Technicians and related support occupations (203-235) Sales occupations (243-285) ** Administrative support occupations, including clerical (303-389) Service occupations (403-469) Production, operators, and repair occupations (473-889)
Occupations2	Creating a dummy; 1 indicates executives and professional (003-199), 0 indicates other (203-899)
Supervisor Support	This variable consists of nine questions. It is defined as the sum of the nine questions divided by 9. (Reverse coded: Alpha = 0.90.)

* QSUP6: My supervisor or manager keeps me informed of the things I need to know to do my job well.
* QSUP7: My supervisor or manager has expectations of my performance on the job that are realistic.
* QSUP8: My supervisor or manager recognizes when I do a good job.
* QSUP9: My supervisor or manager is supportive when I have a work problem.
* QSUP10: My supervisor or manager is fair and doesn't show favoritism in responding to employees' personal or
* QSUP11: My supervisor or manager accommodates me when I have family or personal business to take are of -- for example, medical appointments, meeting with child's teacher, etc.
* QSUP12: My supervisor or manager is understanding when I talk about personal or family issues that affect my work.
* QSUP13: I feel comfortable bringing up personal or family issues with my supervisor.
* QSUP14: My supervisor or manager really cares about the effects that work demands have on my personal and family life.

(1 = strongly agree, 2 = somewhat agree, 3 = somewhat disagree,4 = strongly disagree)

Demographic characteristics

Gender	QSC8: Gender (1 = male, 0 = female)
Age	QPD1: May I ask how old you are?
Race	QPD4: Race (white, black, A-Indian, Asian, other/mixed)

	**	White
		African American
		Native American
		Asian
		Other races
Race2		1 indicates white, 0 indicates all other.
Education		RED6: Highest level of schooling completed
		Less than high school diploma
	**	High school diploma or GED
		Some colleges
		Associate degree
		Bachelor degree
		Graduate or professional schools
Education2		1 indicates more than bachelor degree, 0 indicates all other.
Marital status		QEB38: How long have you worked for this employer/ been Married for a first time, remarried, and living with someone as a couple.
	**	Single and never married
		Divorced, widowed, and separated
Marital status2		1 indicates married, 0 indicates all other (single, divorced, separated, widowed).
Having children at home		QEN1: Are you the parent or guardian of any child of any age? Please include your own, stepchildren, adopted, foster, grandchildren, or other for whom you act as a parent (1 = yes, 0= no)
Having elderly people at home		QEC1: Within the past year have you provided special attention or care for a relative or in-law >65 -- helping w/ things that were difficult or impossible for them to do themselves? (1 = yes, 0 = no)

APPENDIX B: Results of the Rotated Principal Component Factor Analysis

Items	1	2	3	4	5	6
1. Stress						
QPW3: How often have you felt nervous and stressed?	-0.107	0.299	-0.010	-0.008	-0.122	**0.647**
QPW4: How often have you felt that you were unable to control the important things in your life?	-0.041	0.138	-0.037	0.004	-0.096	**0.635**
QPW5: How often have you felt confident about your ability to handle your personal problems?	-0.079	-0.101	-0.067	-0.019	0.080	**0.627**
QPW6: How often have you felt that things were going your way?	-0.162	0.007	-0.093	-0.136	-0.104	**0.715**
2. Job Demands						
QWC12: I never seem to have enough time to get everything done on my job.	-0.129	**0.791**	-0.050	0.035	-0.028	0.166
QWC53: Thinking about your main job, tell me how often you have felt overwhelmed by how much you had to do at work in the last 3 months?	-0.229	**0.745**	-0.099	-0.071	0.034	0.099
QWC54: And how often in the past 3 months, have you been asked by your supervisor or manager to do excessive amounts of work?	-0.117	**0.757**	0.041	0.092	0.010	0.002
QWC56: During a typical workweek, how often do you have to work on too many tasks at the same time?	-0.065	**0.664**	0.088	0.191	-0.140	0.005
3. Autonomy						
QWC1: I have the freedom to decide what I do on my job.	0.134	-0.056	**0.706**	0.262	0.071	-0.115
done.	0.056	0.026	**0.693**	0.057	0.091	0.022
QWC7: I have a lot of way about what happens on my job.	0.184	-0.015	**0.617**	0.312	0.110	-0.093
QWC9: I decide when I take breaks.	0.090	0.019	**0.744**	-0.027	0.007	-0.077
4. Skill Discretion						
QWC3: My job requires that I keep learning new things.	0.080	0.155	-0.089	**0.772**	0.084	0.006
QWC11: My job requires that I be creative.	0.060	0.088	0.248	**0.707**	-0.036	0.004
QWC13: My job lets me use my skills and abilities.	0.144	0.035	0.196	**0.647**	0.222	-0.106

QWC47: How true is the following statement about your job: I have the opportunity to develop my own special abilities.

0.301	-0.037	0.276	**0.579**	0.209	-0.128

5. Coworker Support

Item						
QWC27: I feel I am really a part of the group of people I work with. job.	0.312	-0.009	0.060	0.198	**0.721**	-0.097
QWC28b: I have support from coworkers that helps me to manage my	0.315	-0.063	0.075	0.134	**0.784**	-0.099
work and personal or family life.	0.317	-0.062	0.180	0.066	**0.675**	-0.056

6. Supervisor Support

Item						
QSUP6: My supervisor or manager keeps me informed of the things I need to know to do my job well.	**0.636**	-0.176	-0.051	0.103	0.206	0.006
QSUP7: My supervisor or manager has expectations of my performance on the job that are realistic.	**0.614**	-0.169	0.018	0.075	0.142	-0.081
QSUP8: My supervisor or manager recognizes when I do a good job.	**0.696**	-0.051	0.008	0.086	0.218	-0.075
problem.	**0.764**	-0.089	0.020	0.075	0.184	-0.025
QSUP10: My supervisor or manager is fair and doesn't show favoritism in responding to employees' personal or family needs.	**0.717**	-0.119	0.122	0.075	0.136	-0.080
QSUP11: My supervisor or manager accommodates me when I have family or personal business to take are of -- for example, medical appointments, meeting with child's teacher, etc.	**0.673**	-0.074	0.169	0.085	0.028	-0.152
QSUP12: My supervisor or manager is understanding when I talk about personal or family issues that affect my work.	**0.811**	-0.048	0.110	0.069	0.055	-0.049
QSUP13: I feel comfortable bringing up personal or family issues with my supervisor.	**0.732**	-0.001	0.168	0.021	0.079	-0.091
QSUP14: My supervisor or manager really cares about the effects that work demands have on my personal and family life.	**0.805**	-0.090	0.139	0.109	0.142	-0.102

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