FAIRNESS AT WORK:
ITS IMPACTS ON EMPLOYEE WELL-BEING

DISSERTATION

Presented in Partial Fulfillment of the Requirements for

the Degree Doctor of Philosophy in the

Graduate School of The Ohio State University

By

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The Ohio State University
2005

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ABSTRACT

While for decades, fairness at work has been an important research topic in the field of organizational behavior, only recently has fairness gained attention among occupational stress researchers. In the last few years, a small but growing literature has found associations between a lack of fairness at work and a decline in employee health indicated by lower self-rated health status, increased sick leave, and more psychiatric disorders. In spite of the increasing attention to fairness, the literature has not yet established a framework to link work environment, fairness at work, and employee health and well-being. This study proposes an integrative framework, identifies the underlying structure of fairness at work, and examines the role of fairness at work in the occupational stress process.

Employees at furniture company distribution centers participated in the study (n = 357). They completed self-administered questionnaires in their worksites. Fairness at work was measured with items derived from interviews with another group of employees in a previous study. Traditionally studied constructs in occupational stress research (job stressors, job control, social support) and employee well-being variables (job satisfaction, global job strain, psychological well-being) were also measured. Confirmatory factor analysis and linear regression were conducted to analyze the data.

Five highly correlated factors were identified for fairness at work: unbiased and respectful treatment of employees, receptivity to employee voice, recognition of employee efforts, willingness to help with problems/special circumstances, and concern about employee well-being. A sixth factor, fairness perception about wages, was also identified. A lack of perceived fairness was negatively associated with employee well-being. This study also found that perceived fairness at work moderates the relationship between workload and job strain; that is, high workload was associated with high strain only when perceived fairness was low. In addition, fairness mediated the relationship between role conflict and job-related well-being. These findings have implications for workplace interventions.

Since this was a cross-sectional study, the causal link implied in the analysis needs to be confirmed with longitudinal studies. Nevertheless, the findings show that fairness at work potentially plays an important role in understanding occupational stress and in enhancing employee well-being.

ACKNOWLEDGMENTS

I wish to thank my advisor, Cathy Heaney, for her guidance all through my doctoral training. Working with her during the last five years has been an invaluable experience, even though half a continent and three-hour time difference separated us the last two years. I am deeply indebted to her for my growth as a researcher.

Pam Paxton's enthusiasm inspired me throughout the data analysis of this dissertation project. She always offered me practical solutions when I felt stuck at dead-end. Her encouragement during my job hunting, which coincided with the height of data analysis, gave a much-needed boost to my confidence. I am particularly grateful for that.

Having Kenny Steinman just a few steps from my office was a comfort, especially after Cathy's departure. Sensing his active research project provided me a vision for my own near future. I thank him for treating me as a future colleague.

I would like to express my gratitude for Robert MacCallum and Michael Browne, whose lectures prepared me well for this dissertation project. As both of these remarkable teachers emphasized, "all models are incorrect, but some are useful." I hope my analysis here is a useful one.

My special thanks go to my husband, Reg Dyck, who has always supported me, and not only as a loving husband. As a scholar, he has demonstrated the discipline of academic work, which kept my motivation high when this dissertation project seemed to

stall. As a community activist and advocate for social justice, he was the inspiration for me to undertake fairness at work as my dissertation topic, the choice I will never regret.

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CHAPTER 1

INTRODUCTION

1.1 Fairness at work and employee health

"It's not fair" is a common remark we hear from people of all ages. Fairness matters to children playing in a playground, students receiving grades, and adults making a living. Standard English dictionaries list "justice" and "fairness" as synonyms. In a colloquial sense, justice and fairness encompass virtues such as moral rightness, equity, honesty, and impartiality. Fairness, or justice, is one of the most fundamental concerns in society. Cohen (1986b) claims that justice is "a central moral standard against which social conduct, practice, and institutions are evaluated" (p. 4). In this paper, justice and fairness will be used interchangeably when they are used alone. When justice is part of a construct name (e.g., distributive justice), it reflects compliance to specific standards defined for each construct.

A phrase such as "a fair day's pay for a fair day's work" symbolizes the importance of fairness at work to employees. In their qualitative analysis of employees' accounts of their jobs, Polayni and Tompa (2004) found the quality of social interactions as one of the emerging concepts that are central to employees' work life. Desirable characteristics of social interaction included fair treatment. While fairness is important for a good workplace, unfairness is often workers' actual experience. In a

phenomenological study of fairness, Mikula (1986) found that the workplace was one of the social settings where most unfair events occurred.

Employees' perceptions of and responses to fairness at the workplace, termed organizational justice, have been important topics in organizational psychology. Major concepts of organizational justice and employees' reactions to various types of injustice in organizations have been well documented (Cropanzano & Greenberg, 1997). Since most organizational justice research has been conducted by organizational behavior researchers, it has tended to focus on outcomes related to the efficiency of organizational functioning: job performance, absenteeism, employees' commitment to the organization, and so on (for reviews, see Cohen-Charash & Spector, 2001; Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Recently, organizational (in)justice and its impact on health have started gaining attention among occupational health researchers. A large-scale longitudinal study conducted in Finland has found that a lack of organizational justice is associated with subsequent self-rated health status decline (Elovainio, Kivimaki, & Vahtera, 2002), absence due to sickness (Kivimaki et al., 2002), and psychiatric disorders (Kivimaki, Elovainio, Virtanen, & Stansfeld, 2003).

The purpose of the present study is to explore the role of fairness at work in pursuing healthy work environments. Within an integrative framework of occupational stress, this study is an empirical examination of the nature of employees' experience of fairness at work, its relationships with other important factors in the occupational stress process, and its impact on employee health and well-being.

1.2 Overview of the dissertation

Chapter 2 will present the background of this study. A critical review of the organizational justice literature reveals that a considerable accumulation of knowledge in the literature implies a link between organizational justice and various employee attitudes toward work, many of which have been of interest to occupational stress researchers. Then a conceptual framework that integrates the organizational justice and occupational stress literatures will be proposed. This framework is used to review a small number of recent occupational stress studies focusing on the impact of organizational justice. In this review, limitations in this new literature will be identified, and challenges in examining fairness in the occupational stress context will be discussed. This discussion then leads to five specific research questions addressed in this study.

Chapter 3 describes the method used in this study. Descriptions of study participants, data collection procedure, and the measures of major variables will be included. The data analysis procedures, namely confirmatory factor analysis (CFA) and linear regression, will be discussed along with issues surrounding these techniques such as missing data treatment, model fit indices, and sample size.

Chapters 4 and 5 present results of the analyses and discuss the findings. In Chapter 4, the first two research questions will be addressed through presenting CFA results of fairness items and discussing the underlying structure of employees' perceptions of fairness at work. Relationships between fairness and other psychological constructs will also be examined. Chapter 5 addresses the other three research questions, which focus on the role of fairness at work in the occupational stress process. Linear

regression results will be presented and the main, mediating, and moderating effects of fairness between job stressors and three outcome variables will be discussed here.

Finally, Chapter 6 summarizes the major findings of the study and examines the implications for intervention. Limitations of the study will be addressed along with recommendations for future research on fairness at work and employee health.

CHAPTER 2

CRITICAL REVIEW OF RELEVANT LITERATURE

2.1 An overview of organizational justice

During the last several decades, the organizational justice literature has identified and described important types of justice in the workplace. Reviewing the development of organizational justice concepts provides an important starting point for examining the impact of fairness at work on employee health.

2.1.1 Distributive justice

Starting in the 1960s, justice research initially focused on distributive justice. A seminal work by Adams (1965) introduced the *equity theory* of distributive justice. Equity theory suggests that evaluations of fairness are not based on the absolute level of outcomes per se but social comparisons of input-to-output ratios. Adams (1965) claimed that in evaluating fairness, individuals first assess the ratio of their contribution (input) to the resulting economic or social compensation (output) and then compare the ratio with that of referent others. Receiving comparatively both too much (overcompensation) and too little (under-compensation) is evaluated as unfair, according to equity theory. Consequently, individuals try to reduce the unfairness by altering input (e.g., working less) or output (e.g., stealing from the company). This fairness evaluation is a totally

subjective process. Although Adams framed equity theory as a general justice theory, it was developed in the context of work organizations (Byrne & Cropanzano, 2001). In organizational settings, the input includes experience, qualification, and effort; the output includes pay, promotion, and other forms of recognition.

Equity theory is considered the basis of organizational justice research. However, its popularity was waning by the mid-1980s (Greenberg, 1990). Along with various methodological criticisms (see Furby, 1986 for summary), equity theory's predictive usefulness was questioned. A main drawback for organizational behavior researchers was that equity theory does not provide specific predictions about people's reactions to inequity (Byrne & Cropanzano, 2001; Furby, 1986; Greenberg, 1990; Leventhal, 1980). The theory predicts two types of possible reactions when people experience inequity: behavioral adjustments (e.g., changing the performance level) and cognitive adjustments (e.g., changing the evaluation of input and/or output). Equity theory, however, does not specify under what conditions each of these reactions would occur (Byrne & Cropanzano, 2001). These limitations of equity theory promoted the shift of emphasis in organizational justice research toward procedural justice.

2.1.2 Procedural justice

Procedural justice research started in 1975, when Thibaut and Walker's seminal work was published, which compared the Anglo-American adversarial legal system to the European inquisitorial system. Thibaut and Walker (1975) found that because the adversarial system allows the disputants process control—or voice—during the presentation of evidence, it was seen as more fair than the inquisitorial system. In

laboratory studies, participants deemed a process to be fair when they had a voice in the process, even though the outcome derived from the process was not desirable to them. This suggests that fairness evaluation of a procedure depends on having opportunities to exercise voice during procedures.

Lind and Tyler (1988) refined this issue further and discussed the difference between having actual control over a procedure and having opportunities to voice one's opinions about the procedure. The distinction was represented in their two models to explain why having a voice enhances procedural justice. The *self-interest model* suggests that individuals want to exercise voice over procedures because it allows them the opportunity to influence the outcome. A second model is the *group-value model*, which considers that having an opportunity to voice opinions satisfies individuals' desire to be heard, regardless of the actual influence they have over the outcome. Merely expressing one's opinion has positive effects, Lind and Tyler (1988) argue, because it promotes group solidarity among those who are involved in the process. This may not achieve an immediate gain (i.e., desired outcome) but may bring about a long-term benefit to the group, in which members perceive that they are valued and treated with respect and dignity (Lind & Tyler, 1988).

While Thibaut and Walker (1975) proposed and Lind and Tyler refined a "voice" tradition, Leventhal (1980) proposed a different set of rules for fair processes of decision making: 1) consistency—procedures are applied consistently across people and across time, 2) bias-suppression—procedures are free from biases, 3) accuracy—procedures ensure that accurate information is collected and used in making decisions, 4) correctability—procedures have some mechanism to correct flawed or inaccurate

decisions, 5) representativeness—procedures ensure that the opinions of various groups affected by the decision have been taken into account, and 6) ethicality—procedures conform to personal or prevailing standards of ethics or morality. These rules intuitively make sense and, in fact, the research on procedural justice in organizations has been almost entirely built on Leventhal's criteria; however, they did not originally emerge from empirical data (Byrne & Cropanzano, 2001).

Although conceptual distinctions between procedural justice and distributive justice are fairly clear, the way these two justice perceptions operate is not distinct. Three recent meta-analyses reported estimated population correlation of .67, .64, and .55 between distributive and procedural justice (Cohen-Charash & Spector, 2001; Colquitt et al., 2001; Hauenstein, McGonigle, & Flinder, 2001).

2.1.3 Interactional justice

Bies and Moag (1986) pointed out that organizational justice research had solely focused on outcomes and procedures as the bases for fairness judgments yet neglected the role of social interactions. They introduced a third dimension to organizational justice: interactional justice. It is defined as the fairness of "the interpersonal treatment [employees] receive during the enactment of organizational procedures" (Bies & Moag, 1986, p. 44). From their survey of MBA students who went through job search processes, the authors identified four communication criteria for a fair recruitment process: truthfulness, respect, propriety of questions, and justification. Although these criteria were derived from one highly specific context, later studies have used them to measure interactional justice in various situations (Colquitt et al., 2001; Moorman, 1991).

There has been a debate on whether interactional justice is a third type of organizational justice or a subset of procedural justice. Although Bies and Moag (1986) see interaction as social enactment of formal procedures, they assert that interactional justice is distinct from procedural justice. Greenberg (1993b) considers interactional justice as a social aspect of both distributive and procedural justice. He suggests new terms: *informational justice* as a social aspect of procedural justice, involving "careful consideration of relevant facts and reliance on accurate information"; and *interpersonal justice* as a social aspect of distributive justice, involving "tactful communication of outcomes and expressions of sincerity" (Greenberg, 1993, p. 237). In an experiment with undergraduates, Greenberg (1993) demonstrated that informational validity (an operationalization of informational justice) and interpersonal sensitivity (an operationalization of interpersonal justice) independently influenced participants reactions to underpayment. Cropanzano and Ambrose (2001) support Greenberg's view (1993), stating that interactional justice is "part procedure, part outcome" (Cropanzano & Ambrose, 2001, p. 125).

Bies (2001), one of the original authors who proposed interactional justice as a third type of organizational justice, explains that because Bies and Moag (1986) discussed interactional justice in the context of a decision making process in work organizations, it was misconceptualized as a subcomponent of procedural justice. He insists that interactional justice is distinguishable from procedural justice if the concept is not limited to the quality of interpersonal treatment during enactment of formal organizational procedures (Bies, 2001). Empirical support for this view, however, has not been provided.

Although the status of interactional justice is unsettled, it is still useful to consider interactional justice as a third type of organizational justice. In fact, two meta-analyses found that interactional justice did make a unique contribution to explaining many organizational outcomes over and above distributive justice and procedural justice (Cohen-Charash & Spector, 2001; Colquitt et al., 2001). Considering procedural and interactional justice as independent may not be appropriate since a substantial positive correlation (about .60) has been observed repeatedly (Cohen-Charash & Spector, 2001; Colquitt et al., 2001). However, separating them conceptually may benefit the design of research and the interpretation of results.

2.1.4 Consequences of unfairness at work

Outcomes associated with organizational justice include job satisfaction, job performance, employee withdrawal behaviors (i.e., absenteeism, turnover), counterproductive work behavior (e.g., employee theft), organizational commitment, and organizational citizenship behavior[1] (Cohen-Charash & Spector, 2001; Colquitt et al., 2001). Two recent meta-analysis studies found that distributive justice, procedural justice, and variations of interactional justice were all associated with many of the outcomes listed above (Cohen-Charash & Spector, 2001; Colquitt et al., 2001). Associations were in predicted directions: high levels of organizational justice predict high job satisfaction, high performance, low withdrawal, fewer counterproductive behaviors, high organizational commitment, and more organizational citizenship behaviors.

[1] Organizational citizenship behavior is defined as discretionary employee behaviors that improve organizational functioning (Organ, 1990).

These findings indicate that exposure to organizational injustice is associated with consequences similar to those resulting from occupational stressors. Exposure to various types of occupational stressors has been found to affect employees' performance (e.g., Beehr, Jex, Stacy, & Murray, 2000), job satisfaction (e.g., de Jonge, Bosma, Peter, & Siegrist, 2000; Tetrick, Slack, Da Silva, & Sinclair, 2000; Zivnuska, Kiewitz, Hochwarter, & Perrewe, 2002), and withdrawal behaviors (e.g., Bakker, Demerouti, de Boer, & Shoufeli, 2003; Zivnuska et al., 2002). These findings suggest that low levels of organizational justice may act as an occupational stressor and have detrimental effects on employee health and well-being.

While an extensive literature has documented the impact of justice on employee attitudes, there is virtually no systematic understanding of its impact on employee health. The next section presents a framework that integrates organizational justice concepts into an occupational stress approach.

Before proceeding to the next section, it should be noted that organizational justice research has focused predominantly on employees' *perceptions* of injustice. As discussed above, organizational justice research has identified various criteria against which individuals evaluate the fairness of their situations. For distributive justice, employees compare their own input-to-output ratio to similar others (Adams, 1965). For procedural justice, employees perceive a procedure to be fair if they have an opportunity to voice their opinions (Thibaut & Walker, 1975) and consider that rules are applied consistently, personal biases are suppressed, all relevant parties are involved in the process and so on (Leventhal, 1980). Interactional justice is in place if employees are treated with respect and sincerity (Bies & Moag, 1986). Justice in the workplace has

been studied as employees' perceptions of fairness regarding distributive outcomes (e.g., pay raise) or organizational procedures (e.g., performance appraisal).

Determining "objective" conditions of injustice, which these perceptions are supposed to reflect, has not been a focus of organizational justice research (R. L. Cohen, 1986a). Ronald Cohen (1986a) points out the dangers of defining justice exclusively as a matter of perception or, the opposite position, as solely an objective condition. Since the justice/injustice of a particular situation can only be known through individual experience, pursuing "objective" injustice risks replacing the focal person's experience with that of an observer's. On the other hand, assuming that injustice exists only in the eyes of the beholder could easily discount the harm done by social forces.

I would like to clarify my position taken in this study. I am not able to nor do I intend to identify the existence of absolute or universal criteria for justice. However, it is assumed that individuals have their own standards of fairness and that they are able to indicate how much their standards are violated. Fairness, as used in this study, measures the extent of this violation from personal standard. Although study participants were not explicitly asked to indicate their standards of fairness, they were asked to assess the extent to which certain behaviors and conditions exist at their workplace. These behaviors and conditions have been identified as the important components of fairness at the workplace.

2.2 Conceptual framework

In this section, a framework for examining justice, work, and health will be proposed. This framework is built on the claim that occupational stress is a consequence of work organization (NORA Organization of Work Team, 2002), rather than a psychological phenomenon isolated from larger social contexts.

2.2.1 Work organization

In the occupational safety and health field, work organization has become an important concept. It refers to the way jobs are structured and managed in a workplace (NORA Organization of Work Team, 2002). Work organization can be divided into two levels: the company level and the work unit level (Figure 2.1). Company-level work organization reflects on the organization's responses to the demands of the national and global economies, technological advances, political climates, and so on. These responses include production methods (e.g., outsourcing), management structure (e.g., team work), and human resource policies (e.g., compensation systems). The company-level work organization guides the work organization at the work unit level that is the most proximal and tangible to employees' day-to-day work life (Figure 2.1). Work organization at this level includes not only the nature of the work itself (e.g., work load, work pace) but also employee participation in decision making as well as prospects for the future (e.g., stability of employment).

Over the last few decades, manufacturing and production industries have experienced major changes in work organization (Landsbergis, 2003; Landsbergis, Cahill, & Schnall, 1999; Parker, 2003; Smith, 1997). Severe competition starting in the 1970s

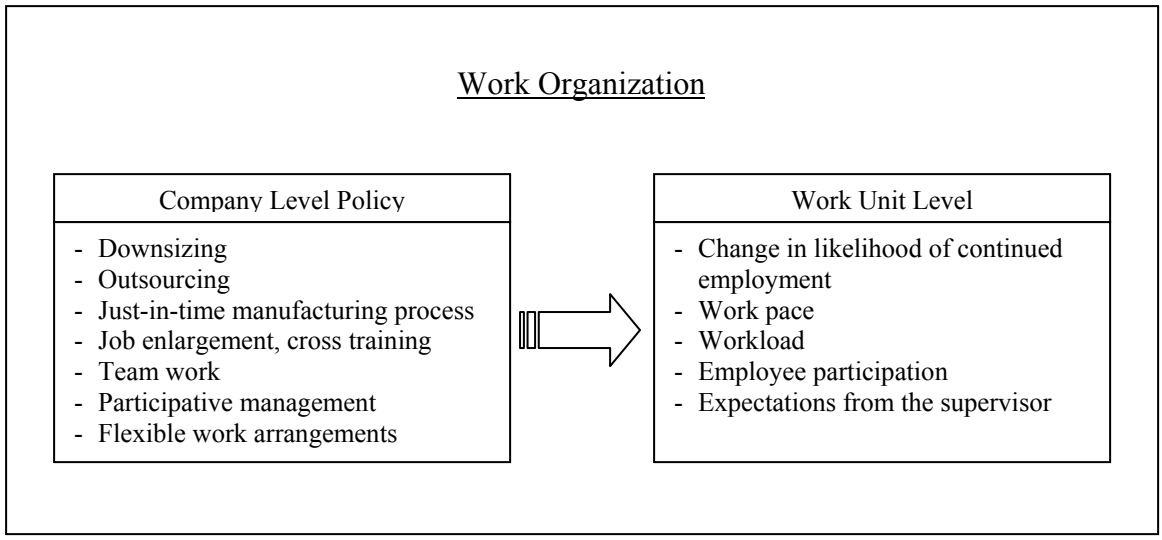

Figure 2.1: Work organization at the company level and the work-unit level (adapted from NORA Organization of Work Team, 2002)

with Japan and other countries has forced US corporations to change their postwar mass-production system, which was characterized by hierarchy in the organizations, standardization of the products, and routinization of the tasks (Smith, 1997). A newly adapted production system, *lean production*, is "an attempt to reduce impediments to the smooth flow of production through continuous improvement in productivity and quality, 'just-in-time' inventory systems, and elimination of 'wasted' time and motion" (Landsbergis et al., 1999, p. 109). In the lean production system, employees are given job enlargement (i.e., a greater variety of tasks at the same skill level) and problem-solving opportunities through quality circles (i.e., small group meetings to solve quality and productivity problems) (Landsbergis et al., 1999).

Smith (1997) characterizes company-level work organization during the 1990s as companies' efforts to achieve flexible work systems in ways that are both numerical (i.e., changing the number of employees according to production demands) and functional (i.e., encouraging employees to fulfill multiple roles). Through company-level work organization, employers expected to see

> newly skilled, continually learning empowered and engaged workers … [who] strive to relax and flatten rigid bureaucracies, trim excessive use of organizational resources (including time, space, and people), and use their experiential knowledge to improve the way they produce goods or serve people. (Smith, 1997, pp. 315-6)

According to some reviews (Smith, 1997; Tausig, 1999), while companies may be achieving numerical flexibility by reducing permanent employment, they are not gaining functional flexibility by empowering their employees. Lean production was claimed to

replace mindless work in mass production with participation and continual skill learning (Womack, 1996); however, one study found that employee participation was limited and that skill utilization declined (Parker, 2003). Comparing various surveys conducted in the US and Europe between 1977 and 1997, Landsbergis (2003) also reported a dramatic increase in both work hours and time pressure as well as a decrease in employee autonomy.

An extensive literature shows that work organization factors such as workload and job control are associated with cardiovascular disease (e.g., Karasek & Theorell, 1990), musculoskeletal disorders (e.g., Davis & Heaney, 2000), and psychological disorders (e.g., Sparks, Cooper, Fried, & Shirom, 1997; Steptoe et al., 1998). A useful model to explain the mechanism through which work organization influences employee health and well-being is provided by Lazarus's transactional model of stress (Lazarus & Folkman, 1984).

2.2.2 The transactional model of stress

The definition of stress has been long debated among researchers. Sonnentag and Frese (2003) list four major conceptualizations of stress: stimulus, response, transaction, and discrepancy. These conceptualizations share an interest in "a process in which environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for diseases" (S. Cohen, Kessler, & Gordon, 1997, p. 3).

Lazarus and Folkman (1984) set forth the transactional model of stress, emphasizing the role of perception and cognitive appraisal in the stress process.

According to this model, stress is neither stimulus nor response but the transaction between person and environment: a person is under stress only when an environmental demand is evaluated as threatening, harmful, or challenging (stress appraisal). This appraisal motivates individuals' coping responses, or efforts to deal with the environmental demand. Coping responses take various forms, from attempts to eliminate or minimize the demand itself (i.e., problem-focused coping) to emotional insulation from harmful effects of the demand (i.e., emotion-focused coping including denial, self-medication, etc.). The type of coping responses individuals engage in reflects their coping resources, or personal and social characteristics that they can mobilize in the face of stressors. Most often studied coping resources include social support and control; both are reported to have direct and moderation (buffering) effects on health and well-being (see Thoits, 1995 for review).

The transactional model of stress suggests that stress appraisal and coping responses mediate the impact of the environmental demand on health and well-being. If the environmental demand is appraised as benign, it does not lead to perceptions of stress. If the environmental demand is appraised as threatening or harmful and thus labeled a stressor, individuals turn to coping resources available to them to deal with the stressor. Available coping resources determine individuals' coping responses, which can affect their health and well-being. Unsuccessful attempts to eliminate the demand (e.g., working excess hours to catch up with workload only to receive more) as well as coping efforts directed toward unhealthy behaviors (e.g., binge drinking, smoking, drug use) will have negative impacts on health and well-being.

2.2.3 An integrative framework

The transactional model of stress is not specifically developed for occupational stress, but this general model is applicable to the stress employees experience at work. Based on the transactional model of stress, I propose an integrative framework incorporating work organization and organizational justice (Figure 2.2). This framework describes various ways that work organization impacts employee health and well-being.

Work organization at the work-unit level creates environmental demands, or potential job stressors. Some can affect employee health and well-being directly, unmediated by psychological processes (pathway A). For example, long work hours (i.e., a work condition) may increase duration of exposure to hazardous substances at work. Regardless of employees' appraisals or perceptions about long work hours, the prolonged exposure to the hazard may cause health problems (e.g., Spurgeon, Harrington, & Cooper, 1997).

Work organization also affects employee health and well-being through stress appraisal and coping responses (pathway B). Individual employees evaluate how threatening, harmful, or challenging their work conditions are and then, according to available coping resources, engage in various coping efforts. These coping responses have impacts on their health and well-being.

While employees appraise the potential threat of work organization, work organization also gives rise to other perceptions, including 1) how much control they have over work, 2) how much social support is available at work, and 3) how fairly they are treated at work (pathway C). These perceptions of work organization serve as coping

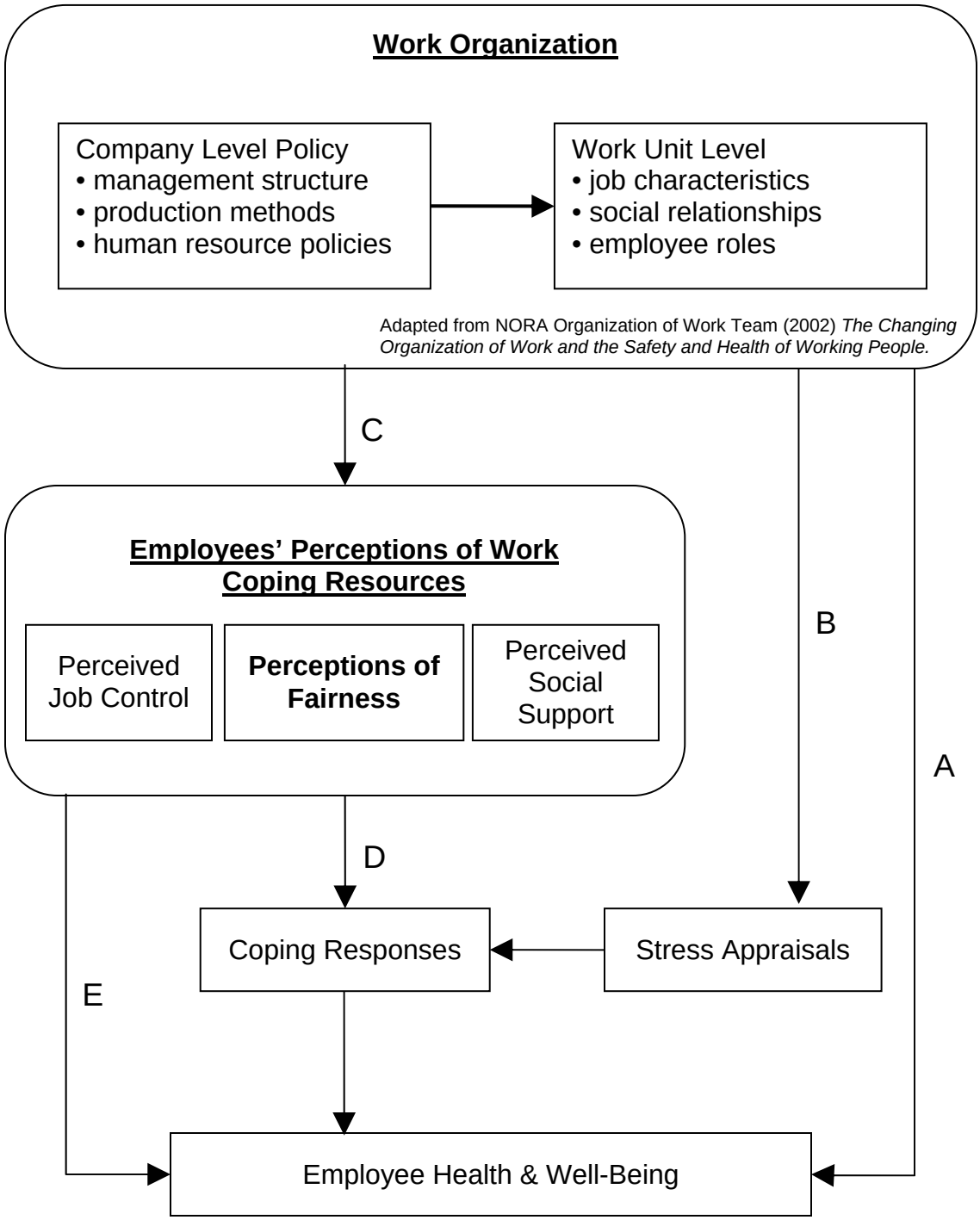

Figure 2.2: A conceptual framework linking work organization, perceived fairness at work, and employee health and well-being.

resources; that is, the extent to which employees feel a sense of control, perceive the availability of social support, and believe that they are treated fairly influences their coping responses in the face of stressors (pathway D). Perceived control, social support, and fairness may also affect employee health and well-being directly (pathway E), regardless of whether work conditions are appraised as threatening. Control, social support, and fairness are considered as fundamental human needs, and thus their absence is detrimental to health (Berkman, 1984; Lerner, 1980; Seligman, 1975).

To illustrate these various pathways through which work organization impacts employee health and well-being, I use contingent employment as an example. Responding to fluctuating production demands, manufacturing companies have become increasingly dependent on contingent employment in forms of outsourcing, subcontracting, part-time employment, and temporary/seasonal employment (Smith, 1997). Contingent employees typically receive no benefits, little training, and lower pay than permanent employees (Aronsson, Gustafsson, & Dallner, 2002; Virtanen, Kivimäki, Virtanen, Elovainio, & Vahtera, 2003). Contingent employment, a form of work organization, can affect the employees' health and well-being in the various ways shown in Figure 2. Lack of training may increase their risk for job related injuries (pathway A). High job insecurity will likely be appraised as threatening (pathway B). If contingent employees do not have valuable skills to make them employable (a coping resource), they may engage in self-medication instead of looking for stable employment (a coping response). Because of their temporary and marginal status in the company, contingent employees may perceive themselves to have little control over work, little social support available from coworkers or supervisors, and little access to fair treatment (Aronsson et

al., 2002; J. K. Rogers, 1995). This is represented by pathway C. These perceptions may result in low self-esteem and other psychological malfunctioning (pathway E) as well as a reduction of positive coping responses (pathway D). Each of these pathways may lead to significant health consequences[2].

2.2.4 Exploratory studies on health and justice

In recent years, a small but growing number of studies explore the role of organizational injustice in the context of occupational stress. The integrative framework proposed above will help organize findings from these exploratory studies and identify directions for this and future studies.

Fox and colleagues (2001) recognize organizational injustice as an occupational stressor, claiming that it "fits definitions of job stressors as being situations that elicit an adaptive response or … negative emotional reactions" (p. 294). This claim comes close to being a tautology; nevertheless, their findings suggest that distributive justice, procedural justice, social support, and organizational support were all associated with negative emotions among students and non-student employees of a university and various companies. Similarly, in their study of more than 1000 government employees in Canada, Francis and colleagues (2003) found that the three types of justice together (distributive, procedural, and interactional justice) explained unique variance in employee well-being after controlling for job control and job insecurity. These results support the hypothesis that fairness influences emotional well-being. However, neither study included coping behaviors in their analysis. Therefore, it was left unexamined whether or not the

[2] Although the presented framework describes the flow as linear from work organization toward employee health and well-being, it is more likely to be an iterative process with many feedback loops (e.g., employee

relationship between exposure to injustice and strain was mediated by coping responses such as heavy drinking.

A group of researchers in Finland has undertaken the first large-scale, longitudinal study examining the relationship between fairness at work and health (Elovainio, Kivimäki, Steen, & Vahtera, 2004; Elovainio, Kivimäki, & Vahtera, 2002; Kivimäki, Elovainio, Vahtera, & Ferrie, 2003; Kivimäki, Elovainio, Vahtera, Virtanen, & Stansfeld, 2003; Kivimäki et al., 2004). Age, income, smoking status, alcohol consumption, extent of sedentary lifestyle, body mass index, workload, job control, and social support were measured and controlled for in their analyses. Using a common organizational justice measure developed by Moorman (1991), Kivimäki and Elovainio's group showed that procedural justice and interactional justice predicted self-rated health status and minor psychiatric disorders among over 4000 Finnish hospital employees. These results suggest that fairness has impact on employee health over and above the effects of job control, social support, certain aspects of work organization (i.e., workload, pay), and some potential coping responses (i.e., smoking, alcohol consumption). Kavimaki and colleagues (2004) found the same results from the Whitehall II study, a 7-year study of London civil workers. They provide important support for the influence of organizational justice on health and well-being.

The above studies focused on unfairness solely as an occupational stressor but did not explore its other potential roles (e.g., moderator, mediator). What differentiates Zohar's work (Zohar, 1995) from these other studies is the testing of a model that describes fairness as a moderator. This model suggests that the effect of stressors on

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health influences stress appraisal).

employee well-being depends on the level of fairness. He focused on the relationship between role-related stressors (i.e., role ambiguity, role conflict, role overload) and perceptions of fairness from the supervisor. His fairness-moderator model suggests that if employees perceive higher levels of fairness in their supervisors, the impact of role stressors on their well-being would be alleviated. Although his data did not support the moderator model, this may have been due to the study's cross-sectional design. As House (1981) discussed, the current level of employee health may reflect both current and past exposure to job stressors, and the effects of past and present exposure to job stressors on health may have been moderated by fairness. Since the past exposure to job stressors is not measured in Zohar's study (1995), the moderating effect of fairness between the past job stressor and current employee health may appear as the main effect of fairness.

Exploring the role of fairness as a moderator remains important because moderator effects suggest the possibility that intervention may reduce the detrimental effects of stressors that are difficult to modify (Vermunt & Steensma, 2001). Janssen (2004) examined whether distributive justice and procedural justice have a two-way interaction effect in the relationship between a stressor (i.e., demands for innovative behaviors) and strain (i.e., job-related anxiety) among managers in healthcare organizations. Janssen (2004) found that high levels of job demands were associated with high job-related anxiety and burnout only when distributive justice and procedural justice were both perceived as low. When one of the two types of organizational justice was perceived as high, the level of demands was not associated with anxiety or burnout. This suggests that fair procedures in the workplace may protect health of employees who

are exposed to high job demands and perceive that their compensation is not fair. When job demands and compensation are difficult to change, fair procedure may be easier to achieve.

The interest in stress and justice seems to be growing not only among psychologists and health researchers but also among organizational justice researchers. From a study of 174 university faculty members, Judge and Colquitt (2004) found that the extent to which employees perceived the university's work-family policies (i.e. assistance to reduce work-family conflicts) as fair predicted stress levels six months later. Using the transactional model of stress (Lazarus & Folkman, 1984) as a template, Greenberg (2004) proposes the Justice Salience Hierarchy, in which he describes distributive injustice as a stressor, procedural justice evaluation as primary appraisal, and interactional justice evaluation as secondary appraisal and coping resources. His assumption that if procedural justice is in place, distributive injustice does not cause any harm is controversial; nevertheless, this hierarchy does offer both a way of linking justice and stress and potential intervention approaches.

All of the studies reviewed above demonstrated that organizational injustice was associated with employee well-being. However, sufficient studies have not been conducted to allow researchers to examine relationships between organizational justice and other major factors in the occupational stress process. Also, a conceptual framework has not been developed that synthesizes findings from various studies. More systematic investigation is needed in order to better understand the relationship between fairness at work and employee health. Practical recommendations can then be made to enhance employee well-being.

2.3 Challenges in integrating organizational justice into the context of occupational stress

Organizational justice and occupational stress are well-established fields of research with clearly different roots and goals. Thus, integrating the two requires careful consideration about their conceptualization and operationalization of major constructs. In this section, I will discuss several concerns in examining fairness at work in relation to occupational stress.

2.3.1 Measures

The overall purpose of research shapes the way its constructs are measured. Although borrowing well-established measures is a recommended practice (Streiner & Norman, 1995), occupational stress researchers who wish to measure fairness at work using existing organizational justice measures must realize the way the purpose of organizational justice research is reflected in these measures. Because organizational justice research has typically focused on effective organizational functioning, measures assess fairness at work with regard to formal organizational procedures and outcomes such as performance appraisal, pay raise/cut, and lay offs. In his review of organizational justice measures, Greenberg (2001a) explicitly encourages organizational justice researchers to develop measures that are as specific as possible to the organizational procedure in question. However, studies of occupational stress have a different purpose: enhancing employee health and well-being rather than effective organizational functioning. Thus, it may not be useful to assess employees' perceptions of the fairness of specific formal organizational procedures.

Understanding the impact of the day-to-day experience of unfairness may be more important for enhancing employee well-being than understanding the fairness of discrete organizational events or procedures. Stress research in general has shifted its focus from the impact of major life events to that of stable, repetitive, and low intensity problems that people encounter on an ongoing basis (Lepore, 1997). Stress research has accumulated evidence that the latter type of stressors have significant impact on health and well-being (e.g., Burleson et al., 2002; Ewart & Suchday, 2002). While major events at work such as lay offs do have significant effects on employees' health and well-being (e.g., Kivimäki, Vahtera, Elovainio, Pentti, & Virtanen, 2003), these events do not occur everyday. Tepper (2001) claims that general perceptions of fairness at work play an important role in occupational stress because "…many manifestations of distress are the results of day-to-day injustices that might seem trivial on their own, but which in the aggregate have implications for one's well-being" (p. 211). If the focus of a study is on accumulated daily experience of unfairness and its impacts on health and well-being, general perceptions of organizational fairness should be measured.

One of the most widely used measures of organizational justice, developed by Moorman (1991), has three subscales corresponding to the three major concepts of organizational justice: the distributive justice subscale based on equity theory (Adams, 1965), the procedural justice subscale based on Leventhal's criteria for fair formal procedures (1980), and the interactional justice subscale based on Bies & Moag (1986). Although most of the exploratory studies on justice and health reviewed above used Moorman's scale, it is not designed to assess employees' day-to-day experience of fairness/unfairness. Rather than directly adopting measures developed for organizational

justice research, occupational stress researchers must determine how to assess general perceptions of fairness at work.

In addition to their focus on formal procedures and outcomes, organizational justice measures have another shortfall that may concern occupational stress researchers. None of the commonly used measures were developed based on employees' own accounts of fairness or unfairness at work. For example, Folger and Konovsky (1989) developed a procedural justice measure partly based on Greenberg's open-ended survey study (Greenberg, 1986). The participants of Greenberg's study (1986) were managers, not subordinates, who reported what they thought made performance appraisals fair. Measures for interactional justice were often based on the study by Bies and Moag (1986). Their participants were MBA students who went through the job search process and reported fair and unfair treatment during job interviews. These measures may capture employees' experience of fairness and unfairness to a certain extent, but there may be missed aspects. Because the health and well-being of individual employees are the main focus of the occupational stress research, measures used should reflect their experience of fairness and unfairness. A new measure of perceived fairness at work must be developed based on employees' own experience.

2.3.2 Conceptual overlap: Interactional justice and social support

Interactional justice and social support are both concerned with social interactions at work. However, these two concepts have not been studied together because organizational justice research does not include social support in its lexicon, just as stress

research does not include interactional justice[3]. The examination of fairness at work using the occupational stress framework cannot ignore social support because it is an important factor influencing the relationship between occupational stressors and health (House, 1981; Thoits, 1995). Similarities and differences between social support and interactional justice must be discussed.

Social support is defined as interpersonal transactions intended by the sender to be supportive in dealing with life's problems (Heaney & Israel, 1997). Such interpersonal transactions involve emotional concern, respect, affirmation, and tangible aids. It is typically measured by the receiver's perceptions of such transactions. Senders of social support usually have continuing relationships with the recipient as, for example, family members, friends, coworkers, or supervisors. Reviewing experts and laypersons' descriptions of helping behaviors, House (1981) identified four types of social support: emotional support (i.e., providing love, caring, and empathy), instrumental support (i.e., providing goods, money, and services that directly help the recipient), informational support (i.e., providing information about resources that may help the recipient), and appraisal support (i.e., providing information about self-evaluation). One behavior can convey more than one type of support. For example, lending money to a friend can be a direct help (i.e., instrumental support) while also showing concern for the friend (i.e., emotional support). Different types of support are difficult to empirically distinguish because of high correlations among them (House & Kahn, 1985). Instead, researchers have found that the source of support is more clearly distinguishable (e.g., Clara, Cox,

[3] One exception is a study by Colquitt (2001). In examining the dimensionality of organizational justice, Colquitt (2001) found a weak but positive association between helping behaviors among work team members and the inter*personal* justice (a subtype of interactional justice) of the supervisor.

Enns, Murray, & Torgrude, 2003). Different sources of support may be important in varying degrees depending on the problem for which the support is needed (House & Kahn, 1985; Thoits, 1995). For example, supervisors, coworkers, and spouses are more important sources of support than friends and relatives for work-related problems (House & Kahn, 1985).

Interactional justice is defined as fairness of interpersonal treatment during the implementation of organizational processes (Bies & Moag, 1986). It is typically measured by asking the employee if the supervisor (i.e., the agent of organizational policies and processes) shows consideration, gives timely feedback, provides explanations, and communicates candidly and respectfully (see, Colquitt, 2001; Folger & Konovsky, 1989; Moorman, Blakely, & Niehoff, 1998). These behaviors correspond with social support. For example, when the supervisor shows consideration for employees' situations and communicates to them with respect, they are receiving emotional support. By giving timely feedback and explanations, the supervisor is sending informational and appraisal support.

Table 2.1 compares behaviors that indicate social support and interactional justice. The interactional justice construct includes negative behaviors that indicate interactional *in*justice whereas social support, by definition, includes only positive behaviors. Therefore, *social undermining* was also shown in Table 2.1 to correspond with interactional injustice. Social undermining, or negative social interaction, is a separate concept, rather than a lack of social support (Vinokur & van Ryn, 1993). As shown in Table 2.1, a considerable overlap exists between the behaviors indicating social support

Social Support[1]	Interactional justice[2]
Emotional support ▪ Listening to the person's concern ▪ Expressing respect and esteem for the person ▪ Showing empathy and trust Appraisal support ▪ Providing feedback ▪ Providing reference for social comparisons Informational support ▪ Giving information that can be used to solve the person's problem ▪ Providing advice and suggestions Instrumental support ▪ Providing material aid and/or direct service (e.g., lending money, babysitting, giving a ride)	Positive behaviors: ▪ Listening to subordinates' personal concerns ▪ Considering subordinates' viewpoints ▪ Treating subordinates with respect and dignity ▪ Providing feedback ▪ Explaining reasons for important decisions
Social Undermining[3]	Negative behaviors indicating interpersonal *in*justice:
Negative affect ▪ Showing anger and dislike ▪ Insensitivity/ridicule Criticism ▪ Criticizing attributes, actions, and efforts Social hindrance ▪ Making unreasonable instrumental goals ▪ "Silent treatment" (withholding information)	▪ Making prejudicial/improper remarks ▪ Deceiving/lying/breaking promises ▪ Invading privacy ▪ Making wrongful accusations ▪ Using pejorative labels (e.g., troublemaker) to stigmatize a subordinate

[1] adapted from House (1981)
[2] adapted from Bies and Moag (1986), Bies (2001), and Moorman (1991)
[3] adapted from (Finch, Okun, Pool, & Ruehlman, 1999; Vinokur & van Ryn, 1993)

Table 2.1: Behaviors indicating social support, social undermining, and interactional justice.

and the positive behaviors indicating interactional justice, as well as between the behaviors indicating social undermining and interactional injustice.

This overlap between social support and interactional justice justifies Kivimäki and colleagues' decision in their study examining interactional justice as a predictor of self-rated health using the Whitehall II study data. Since the study did not include standard justice items, Kivimäki and colleagues (2004) constructed their 5-item interactional justice scale borrowing three items from a social support measure (i.e., "Do you get consistent information from your superior?"; "Do you get sufficient information from your superior?"; and "When you are having difficulties at work, how often is your superior willing to listen to your problems?"). They found the best predictor of self-rated health was an item that descried a social undermining behavior (i.e., "Do you ever get criticized unfairly?"). This is consistent with the finding from some studies that compared social support and social undermining in their impacts on health. They found that social undermining had a stronger effect (e.g., Duffy, Danster, & Pagon, 2002; Vinokur & van Ryn, 1993) .

Social support and social undermining are both unipolar concepts (i.e., only include zero to positive values) whereas interactional justice is a bipolar concept (i.e., can include negative values). Stress researchers treat social support and social undermining separately, mainly focusing on the presence and absence of social support and not always the presence and absence of social undermining. Organizational justice researchers, on the other hand, generally address interactional justice and injustice as one continuum, which makes interactional justice a partly overlapped construct with both social support and social undermining. Since the social support literature has found that the inverse

relationship between support and undermining was only moderate in size and that undermining had greater impacts on health, considering interactional justice and injustice as separate constructs may be useful to understand their roles in the occupational stress process.

2.3.3 Conceptual overlap: Fairness and control

The relationship between control and fairness was addressed above in the discussion of procedural justice. Thibaut and Walker (1975) found that people evaluated a procedure as being fair when they had a voice in it. Refining this, Lind and Tyler (1988) assert that control is a key to fairness; that is, having a voice in a procedure is fair because it provides the possibility of having control over the outcome. Not being allowed to have a voice, on the other hand, is unfair because it denies the opportunity to influence the outcome. Lind and Tyler (1988) called this explanation of procedural justice the self-interest model. Elovainio and colleagues (Elovainio, Kivimaeki, & Helkama, 2001; Elovainio et al., 2004) assert that fairness perceptions mediate the relationship between job control and employee well-being. Based on the self-interest model of procedural justice, Elovainio and colleagues claim that a high level of job control increases the sense of fairness, which in turn positively affects employee health. They found support for this mediation hypothesis first in a cross sectional study (Elovainio et al., 2001) and then in a longitudinal study (Elovainio et al., 2004).

Having a voice, however, does not always result in control. People's voices may be heard, but the outcome can be undesirable to them. As Thibaut and Walker (1975) demonstrated, people still prefer a procedure that allows them voice to one that does not,

regardless of the outcome. Having a voice is having the *possibility* of exerting control. This possibility of control plays an important part in establishing fairness because, according to Lind and Tyler (1988), it characterizes the group one belongs to (the group-value model). Allowing every member to have voice in a process means that no one is denied the possibility of exerting control. The group values every member, and every member deserves the right to exert control over outcomes. Even though the outcome today is not desirable, it can be expected in this group that one's desires will be reflected in future outcomes.

Whereas Lind and Tyler's group-value model is a belief about rather discrete groups (i.e., work unit, department, company), Melvin Lerner's belief in a just world (BJW, Lerner, 1980) is a similar concept regarding a broader world in which individuals psychologically exist. According to Lerner (1980), people have a need to believe that they live in a just world in which expectations are met, promises are fulfilled, and social contracts are honored. In other words, a just world is a highly orderly, predictable world where people receive all, and only, what they deserve. In a just world, people can develop a sense of control over their lives through their sense of deserving (Furnham, 2003). Individuals may feel that they can avoid a negative event by doing nothing to deserve it. Here is a difference between the group-value model of procedural justice and BJW. Control in BJW is based on outcome expectation (i.e., in a just world, the link between one's behavior and the outcome is strong) whereas control in procedural justice is based on self-efficacy (i.e., one can influence the outcome if the procedure allows voice).

Predictability and control are closely related concepts. If there is no predictability in the world, there is nothing under personal control. However, predictability is only a necessary but not a sufficient condition for control. Having control over an event requires that the event be predictable, but being able to predict the event does not always provide control over it. Nevertheless, a just world, which is a predictable world, provides at least the possibility of personal control. Van den Bos and Lind (1998; 2002) propose that fairness matters when people find themselves in uncertain, unpredictable situations. This suggests that fairness has a moderation role in the relationship between uncertainty and negative reactions.

Up to this point, control and fairness have been discussed at the individual level since procedural justice and BJW are both individual-level constructs. An equally important issue is the relationship between collective control and fairness. Saul Alinsky (1971) wrote that mass organization is to give power to the have-nots so that "equality, justice, […] full and useful employment, [and] health" (p. 5) are actualized. Closely identified with Alinsky's confrontational approach for change, labor unions are an example of collectively exerting control over work conditions (e.g., enforcing living wage). Collective control is a means to achieve fairness, according to Alinsky (1971); at the same time, having collective control itself is fair because it ensures the means to achieve common goals including fairness.

Control and fairness have a complex and intertwined relationship involving entitlement, predictability, and uncertainty. The association between a sense of control and individuals' health and well-being has been well-documented (e.g., Karasek & Theorell, 1990; Mirowsky & Ross, 1990; Ross & Sastry, 1999; Paul E. Spector, 1986).

The intricate relationship between control and fairness should be considered carefully when examining fairness in relation to health.

2.4 Research Model and Research Questions

The integrative framework proposed above (Figure 2.2) conceptualizes work organization and fairness at work within the transactional model of stress. Figure 2.3 is the model representing this study's operationalization of some of the components in the conceptual model. Company level work organization was not measured in this study, but it is assumed to directly or indirectly influence all other variables. Four of the most commonly studied work unit level work organization characteristics were measured as job stressors: workload, role conflict, role ambiguity, and mental demands. Employees' well-being and attitudes toward their jobs were operationalized with three constructs: job satisfaction, global job strain, and psychological well-being. Job control and social support from the supervisor and coworkers were included because of their well-documented relationships with employee well-being. The main variable of interest was perceived fairness at work. Inductively developing a measure of fairness at work was the first aim of this study. After the underlying structure of fairness at work was determined, the role of fairness at work in the relationship between job stressors and employee well-being was explored. Specific research questions are listed below.

(1) What is the nature of employees' day-to-day experience of fairness at work?

As described above, one of the problems in importing organizational justice concepts into occupational health research is the measurement issue. Many well-used organizational justice measures were developed deductively from theory. In addition, because

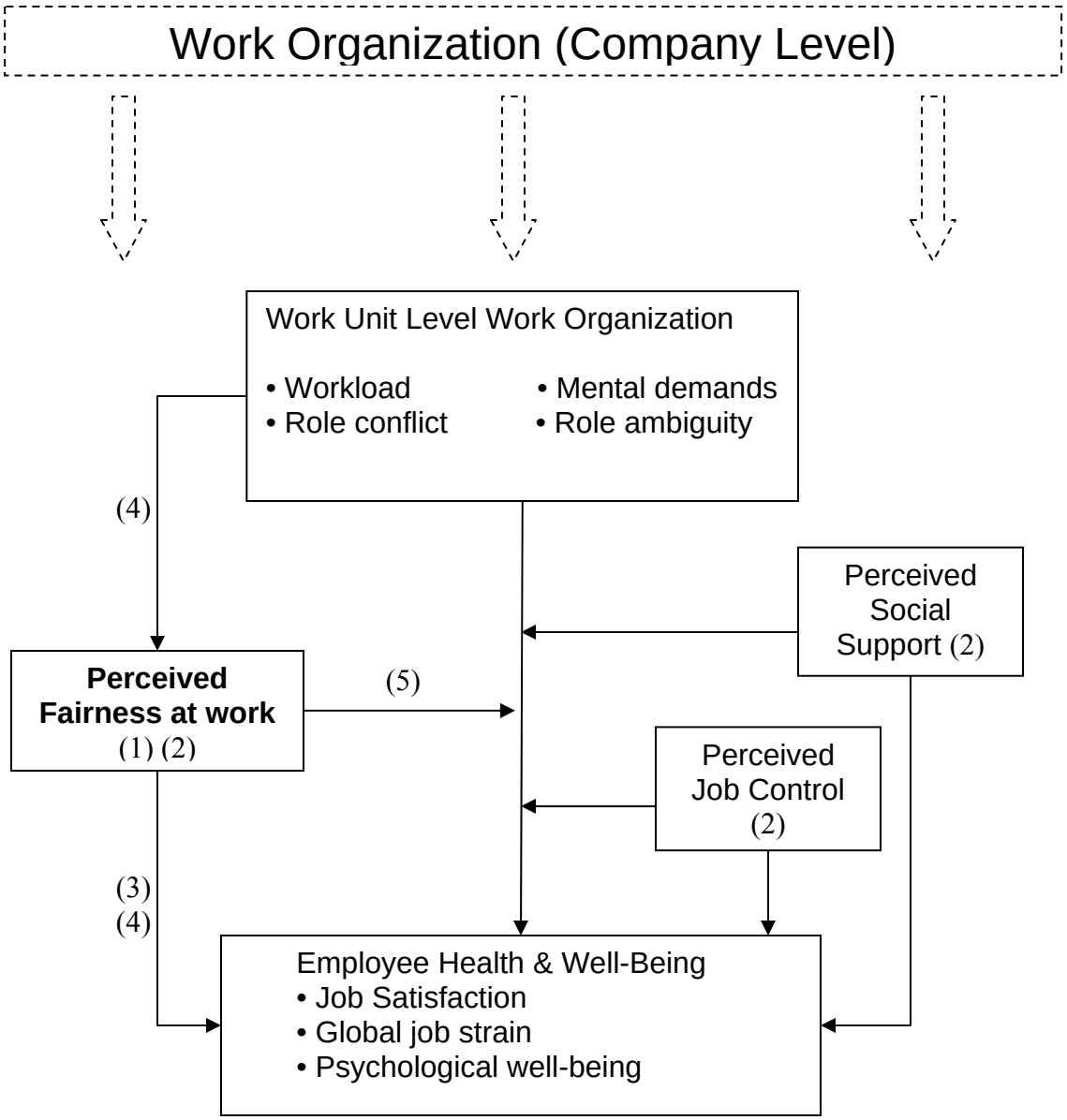

Figure 2.3: A study model with fairness at work as a potential mediator and moderator. The numbers in parentheses correspond with the research questions.

organizational justice research has focused on context-specific perceptions of fairness (e.g., fairness of the supervisor during the performance appraisal), the nature of general perceptions of fairness at work is not known. A context-neutral perception of fairness at work may or may not consist of components other than distributive, procedural, or interactional justice. The first step for examining fairness in an occupational stress framework is to inductively develop a measure based on a previous qualitative study (Heaney & Joarder, 1999) that reflects employees' day-to-day experience of fairness at work and then to explore its underlying structure.

(2) What are the relationships among fairness, control, and social support?

As described above, fairness, control, and social support are partially overlapped concepts. The extent of overlap must be empirically determined.

(3) Does fairness contribute to explaining employee well-being over and above the effects of established occupational stressors, social support, and control?

Several exploratory studies have found that fairness is associated with well-being (e.g., Kivimäki, Elovainio, Vahtera, & Ferrie, 2003) and have concluded that the lack of fairness is a stressor. The influence of fairness on employee health and well-being will be supported if there is a significant association between the two after controlling for social support, control, and other occupational stressors.

(4) Does fairness mediate the relationship between stressors and employee well-being?

Fairness may be a mediator between the stressors and employee well-being. That is, stressors may trigger the sense of unfairness, which in turn influences well-being. Exposure to high levels of stressors may be perceived as unfair, especially when the stressors are seen as avoidable or unnecessary. For example, role conflict (i.e.,

conflicting job demands) can be seen as an unnecessary stressor because if priorities among job tasks are clearly defined, there should not be conflicts among job tasks. Employees who experience high levels of role conflict may feel that they are subjected to something they do not deserve. According to the BJW hypothesis (Lerner, 1980), this situation will be perceived unfair. It may then lead to strain. The mediator effect of fairness will be supported if the association between the stressors and well-being is reduced when fairness is included in the model.

(5) Does fairness moderate the relationship between stressors and employee well-being?

Fairness may also function as a moderator between the stressors and employee well-being because fairness can be a coping recourse for employees who are exposed to stressors. For example, employees may be less adversely affected by high workload if the supervisor assigns tasks equally among employees compared with a supervisor who does not. The impact of stressors on employee well-being may depend on the levels of fairness. The expected interaction was shown in Figure 2.4. It is unlikely that a high level of fairness is associated with a higher level of strain than a low level of fairness when the stressor level is low. Therefore, there will be a main effect and interaction rather than a cross-over interaction. The moderator effect will be supported if, given high levels of stressors, better employee well-being is associated with high levels of fairness.

Figure 2.4: Expected interaction effect between stressor and fairness on employee well-being.

CHAPTER 3

METHOD

3.1 Study Design and Background

Data for this study were collected as part of a larger research project, "Biomechanical and Psychosocial Risks for Low Back Disorders" (PIs: Catherine A. Heaney, William S. Marras), funded by the National Institute for Occupational Safety and Health. The main purpose of this project is to simultaneously examine the impact of biomechanical demands (e.g., heavy carrying, lifting, pushing) and the psychosocial environment at work (e.g., social support, role conflict, control) on low back disorder among manual material handling workers. The project uses a prospective cohort design. The data collection includes a group-administered survey at baseline, followed by a 6-month assessment.

This dissertation used a cross-sectional design, analyzing the data from the first (baseline) data collection. There was no manipulation of independent variables (i.e., fairness, stressors, social support, or control). Thus, this is an observational study.

3.2 Study Population and Data Collection Procedures

In total, 357 employees in manual material handling (MMH) jobs at furniture company distribution centers participated in the study. They worked at six distribution

centers in Ohio, Illinois, North Carolina, and Georgia. All MMH employees within each facility were invited to participate in the study. A small number of employees (16) were not available for the study due to sick leave (8), vacation (3), off-site duty (3), language difficulty (1 Arabic), and refusal (1). This made a response rate of 95.7%.

Table 3.1 shows the demographic characteristics of the study participants. The age of the participants ranged from 18 to 77 years, with the average of 34 years old. Not surprisingly given the nature of the MMH work, over 97% were men. Slightly less than half reported themselves as Caucasian, a little over a quarter as African American, and 16% as Latino or Hispanic. More than 15% preferred Spanish over English, although some of them were fluent in spoken English. A small number of the participants needed the questionnaire to be read to them. While only 9 (3%) out of the 300 English speaking participants asked for the questionnaire to be read, 11 (19%) of the 57 Spanish speaking participants needed this arrangement. More than half of the participants were married or had a partner. Almost a third of the employees had worked for their companies for one year or less. The median hourly wage was $9.58. This is considerably lower than the national median hourly wage for male MMH workers of $11.43 (Bureau of Labor Statistics, 2004).

Demographic variable	Frequency	%
Age		
Younger than 25	82	23.2%
25 - 34 years old	111	31.4%
35 - 44 years old	86	24.3%
45 - 54 years old	61	17.2%
55 years or older	14	4.0%
Sex		
Male	347	97.2%
Female	10	2.8%
Race/Ethnicity		
Caucasian/White	168	49.3%
African American	93	27.3%
Native American	6	1.8%
Asian or Asian American	5	1.5%
Latino/a or Hispanic	57	16.7%
Other	12	3.5%
Language		
English	300	84.0%
(Survey administered in an interview)	(9)	(3.0%)
Spanish	57	16.0%
(Survey administered in an interview)	(11)	(19.3%)
Education		
Less than a high school diploma	57	16.2%
High school diploma	163	46.3%
Some college or vocational training	105	29.8%
2-year college degree	17	4.8%
4-year college degree	10	2.8%
Marital Status		
Never married, currently single	89	25.1%
Never married, currently have a partner	59	16.6%
Married	167	47.0%
Separated	11	3.1%
Divorced	29	8.2%

Continued

Table 3.1: Study participants' demographic characteristics

Table 3.1 continued

Demographic variable	Frequency	%
Tenure with the company		
1 year or less	105	30.0%
1 year 1 month to 3 years	104	29.7%
3 years 1 month to 5 years	44	12.6%
5 years 1 month to 10 years	59	16.9%
More than 10 years	38	10.9%
Hourly wage		
Less than $9.00	59	20.2%
$9.00 - $9.99	113	38.7%
$10.00 - $10.99	52	17.8%
$11.00 - $12.99	28	9.6%
$13.00 - $14.99	22	7.5%
$15.00 or more	18	6.2%

A self-administered questionnaire was used to measure fairness at work and other study variables. Details about the measures are described later in this chapter. Data were collection between June 2004 and February 2005. The survey was administered on company time at the participating worksites. In a small-group setting (five to eight participants), the purpose of the study was explained and then informed consent was obtained. The following points were clearly explained: participation was voluntary, whether they participated or not would not affect their relationship with the company or supervisor, and information they provided would be kept strictly confidential. While participants completed the survey, research staff helped anyone who needed assistance in answering questions. The time participants needed to fill out the questionnaire varied considerably, ranging from 20 minutes to over one hour. Participants were paid by the company at their usual rate for the time it took them to participate the study. They received an OSU t-shirt as an incentive.

For those with Spanish as their native language, a Spanish version of the survey was provided. The translation of the survey involved two native Spanish speakers. First, the original English survey was translated into Spanish by a translator who understood the study purpose and constructs to be measured. Second, a professional translator edited the first translation. In the data collection, a native Spanish speaker from the research team assisted in collecting data from Spanish-speaking participants. She translated the explanation of the study into Spanish and helped answer questions from the participants. Informed consent was obtained in Spanish. For those who had low levels of literacy and had difficulties completing the written survey, data were collected through in-person structured interviews conducted in the employee's preferred language.

Data were kept strictly confidential. Participants did not indicate their names, social security number, or any other identifiable information on the survey. ID numbers were assigned to identify individual surveys. The original surveys were stored in a locked file cabinet in the project office, and the list of the participants' names and ID numbers were kept separate from the surveys. The list was available only to the research project staff. Data are to be presented only in aggregate form to the participating companies, at professional conferences, and in publications (including this dissertation). The study protocol and survey (both English and Spanish versions) have been approved by the Ohio State University Institutional Review Board.

The survey data were numerically coded and entered in an SPSS datasheet. Coding decisions and errors were recorded and discussed in regular meetings among the project staff. Analyses were conducted using SPSS and AMOS 5.0 (Arbuckle, 2003) for confirmatory factor analysis and structural equation modeling analysis.

3.3 Measures

The survey instrument was developed using the following process. First, related literatures and existing questionnaire instruments were reviewed to select measures with established reliability and validity. Each item was reviewed and, if necessary, modified so that the reading level was appropriate for people with a high school level education (Flesch-Kincaid Grade Level = 7.8). Second, five cognitive walkthrough interviews with manual material handling workers, who were not in the main study, were conducted. Based on the interviews, some item wordings were adjusted so that the content better reflected the work they do. Finally, two pilot tests were conducted with a total of 55 manual material handling workers. After the first pilot, the reliability coefficient for each scale was calculated. The scales with less than adequate reliability were revised and tested in the second pilot. After the two pilot tests, all scales indicated adequate reliability. The final version of items is presented in Tables 3.2 to 3.5.

3.3.1 Developing Fairness Items

Existing organizational justice measures are designed to assess employees' perceptions of fairness in response to formal organizational procedures. Because the study focuses on employees' day-to-day experience of fairness, a new measure was developed for this study.

A qualitative study by Heaney and Joarder (1999) provided a starting point for the scale development. They interviewed white- and pink-collar employees of a large university about the extent to which they thought they were treated unfairly and the reasons for their responses. Eleven major themes regarding unfair treatment emerged

from the analysis (Table 3.2, left column). They included traditional organizational justice concepts (distributive, procedural, and interactional justice) as well as perceptions that cannot be easily categorized into any of these justice concepts (e.g., "Management looks out for its own interest at the expense of the employees").

Questionnaire items were developed so that they would represent these major themes from Heaney and Joarder (1999). First, items that correspond with the major themes were chosen from two existing measures in the organizational behavior literature; namely, the Perceptions of Fair Interpersonal Treatment Scale (PFIT, Donovan, Drasgow, & Munson, 1998) and the Scale of Perceived Organizational Support (SPOS, Eisenberger, Huntington, Hutchison, & Sowa, 1986). These borrowed items were modified so that each sentence had active voice clearly indicating "management" as the actor (e.g., "Employees are praised for good work" was changed to "Management praises employees for good work."). Second, new items were composed for remaining themes that were not represented by items from either PFIT or SPOS. In total, twenty-eight items were developed (Table 3.2, right column).

Three cognitive walkthroughs were conducted with manual material handling workers who work in Columbus, Ohio. The respondents were asked to think aloud as they answered each question. If they had difficulty in answering questions, the interviewer probed to clarify the problems they had. All cognitive walkthroughs were audio recorded. After each interview, the tape and the notes taken during the interview were reviewed and discussed. Based on the discussions, changes in wording and response options were made. In the next cognitive walkthrough, the respondent's reactions to these changes were carefully observed.

A major change resulting from the cognitive walkthroughs was to create two sets of the same questions: one referring to the immediate supervisor, the other referring to upper management. The cognitive walkthrough respondents had difficulty in choosing one response option for a question about "management" in general because they felt that their immediate supervisors, who work closely with them, behaved differently from people in upper management. After the cognitive walkthroughs, there were 24 items about the immediate supervisor, 25 items about upper management (the same 24 items about the immediate supervisor plus 1 item that is not relevant to immediate supervisors), and 3 items not referring to either the immediate supervisor or upper management. Response options are "Not at all" (1), "Just a little" (2), "A moderate amount" (3), "Quite a bit" (4), and "A very great deal" (5). Exploring the underlying structure of organizational fairness is discussed in the next chapter.

Major themes from the qualitative study (Heaney & Joarder, 1999)	Item that corresponds with the theme *To what extent does your immediate supervisor/upper management …?*	
Employee contributions are not recognized or valued.	1	Appreciate extra effort from employees (SPOS)
	2	Appreciate employees' hard work (PFIT)
	3	Praise employees for good work (PFIT)
	4	Notice if an employee does the best job possible
Employees are treated differently due to race, gender, age, or status.	5	Play favorites (PFIT)
	6	Treat employees differently based on their race
Employees are not treated respectfully by supervisors.	7	Treat employees like children (PFIT)
	8	Treat employees with respect (PFIT)
	9	Yell at employees (PFIT)
	10	Lie to employees (PFIT)
Management does not accommodate employees' unique problems or circumstances.	11	Available to help when an employee has a problem (SPOS)
	12	Understand when an employee is absent due to a personal problem (SPOS)
	13	willing to help employees when they need a special favor (SPOS)
Management is not concerned about employees.	14	Care if employees are satisfied with their jobs (SPOS)
	15	Concerned about employee well-being (SPOS)
Employees have little or no voice in decisions that affect their jobs.	16	Ignore employees' suggestions (PFIT)
	17	Care about employees' opinions
	18	Disregard the consequences of decisions on employees (SPOS)
	19	Ignore employees complaints (SPOS)
Management looks out for its own interest at the expense of the employee.	20	Take advantage of employees if given opportunities (SPOS)
	21	The organization cares more about making a profit than about employee well-being (SPOS)
	22	concerned about paying employees what they deserve (SPOS)
	23†	If the company earned a greater profit, upper management would consider increasing employee salaries (SPOS)
Employees are blamed for things that are not their fault or are outside their control.	24	Employees are blamed for things that are not their fault or are outside their control
Employers make unreasonable demands of employees.	25	Make unreasonable demands of employees
Workloads are inequitably distributed among employees.	26*	Some employees have to do more work than others
Employees experience unnecessary, very high levels of stress	27*	The way things are run here causes workers unnecessary stress
	28*	Employees experience very high levels of stress

PFIT: indicates items adapted form the Perceptions of Fair Interpersonal Treatment Scale (Donovan et al., 1998)
SPOS: indicates items adapted from the Perceived Organizational Support Scale (Eisenberger et al., 1986)
† This item is asked only about upper management and not the immediate supervisor.
* Items do not refer to the immediate supervisor or upper management.
Response options: "Not at all" (1), "Just a little" (2), "A moderate amount" (3), "Quite a bit" (4), "A very great deal" (5)

Table 3.2: Major themes from Heaney and Joarder (1999) and corresponding fairness items

3.3.2 Other Measures Included in the Questionnaire

Job Stressors

Job stressors are defined as work-related environmental conditions thought to negatively impact employee health (Hurrell, Nelson, & Simmons, 1998). Work organization, or the way jobs are designed and managed, creates potential job stressors. Employees' assessments of four types of job stressors will be measured: *Quantitative workload*, *role conflict* (i.e., employees have conflicting job responsibilities), *role ambiguity* (i.e., employees do not have clear explanations of their job roles), and *mental demands* (i.e., vigilance and divided attention). Self-report measures for these stressors are adapted from existing instruments, mainly from the General Job Stress Questionnaire (GJSQ, Hurrell & McLaney, 1988). The GJSQ is a battery of scales measuring exposure to various job stressors, strains, and moderating factors. It has been widely used in occupational stress research. The GJSQ scales were selected by researchers at the National Institute for Occupational Safety and Health, based on its demonstrated reliability and its construct or predictive validity (Hurrell et al., 1998).

Along with established reliability and validity, important criteria for selecting items included eliminating the effect of stressors (i.e., strain) from the respondent's exposure to the stressor. The distinction between stressor and strain is made clear by asking the frequency, extent, or likelihood of certain work conditions rather than asking employees to report their affective responses to the stressors.

Job Control

A six-item scale was adapted from the General Job Stress Questionnaire (Hurrell & McLaney, 1988). Five items assess respondents' sense of control over various aspects of their jobs (e.g., number of tasks, pace); one item assesses a global sense of control at work (Table 3.3).

Social Support at Work

Eight items—four referring to the boss, four referring to coworkers—were adapted from the General Job Stress Questionnaire (Hurrell & McLaney, 1988). Items are shown in Table 3.3.

Outcome variables

Job Satisfaction

Four items were adapted from the General Job Stress Questionnaire (Hurrell & McLaney, 1988). They ask about global satisfaction with the job as opposed to specific aspects (i.e., pay, work schedule). Internal consistency obtained from the first pilot test was not adequate (.66). The response options were modified so that they corresponded better with the questions. Reliability improved in the second pilot test (alpha = .80 as shown in Table 3.3).

Global Job Strain

As a measure of global job strain, the Stress-in-General scale (Stanton, Balzer, Smith, Parra, & Ironson, 2001) was used. It is a global measure of employees' perceptions of their jobs. The scale asks, "All in all, what is your job like most of the

time?", and then provides twelve adjectives or adjective phrases (e.g., hectic, nerve-wracking; see Table 3.3) along with three response options: "yes" (coded as 3 points), "no" (0 point), and "I can't decide" (1.5 points). In developing this scale, Stanton and colleagues (2001) found that these 12 items had substantial factor loadings on a factor different from job satisfaction.

In the pilot study, very few respondents (1 or 2 out of 31 per item) chose the "I can't decide" option. Internal consistency was high (alpha = .90).

Psychological Well-Being

The General Health Questionnaire 12-item version (GHQ12, Goldberg & Williams, 1988) was used to assess respondents' psychological well-being. Although the GHQ was originally developed as a screening tool to detect psychiatric disorders, it has been validated with general population samples (McDowell & Newell, 1996, pp. 225-236). The 12-item US version was used, which addresses depression, anxiety, and disturbance in social functioning (Table 3.3). The original scoring system is to code four response options as follows: better than usual (0), same as usual (0), less than usual (1), and much less than usual (1). In this scoring system, a "1" indicates a negative change, and a "0" indicates no change or a positive change. The scores for the 12 items will be summed, and a total of 3 or more points indicates a probability greater than .50 of having a clinical psychiatric problem (McDowell & Newell, 1996, pp. 225-236).

This scoring system has been criticized for its inability to capture chronic conditions (Goodchild & Duncan-Jones, 1985). All questions in the GHQ are asked about the respondent's feelings "in the past few weeks." If he or she has been feeling

chronically depressed for more than a few weeks, the answer "same as usual" should indicate the existence of depressed feelings. However, in the original coding system, "same as usual" is coded "0", indicating a positive mental state. This results in portraying chronically depressed people as falsely well-adjusted. Huppert and colleagues (1988) proposed an alternative scoring system. The corrected GHQ (CGHQ) reflects changes from what is normal in the population. In CGHQ, "same as usual" is coded (1) if the item is worded negatively (e.g., "constantly under strain") and coded (0) if the item is worded positively (e.g., "enjoy normal day-to-day activities"). With a community sample of over 6500 people, Huppert and colleagues (1988) showed that the CGHQ resulted in a less skewed distribution, with only 3% of people scored 0 (i.e., no psychological problems) as opposed to nearly 30% scored 0 by the original scoring system. They set a higher cut-off point for the CGHQ that best discriminated people with clinical psychiatric conditions from those without such conditions. Goodchild and Duncan-Jones (1985) found similar results with a community sample of 753. Since the sample in this study is a community sample in which few were expected to have clinical psychiatric conditions, the CGHQ scoring system is appropriate to differentiate the participants with low scores.

Higher scores in the CGHQ indicate the likely presence of psychiatric conditions. In this study, the CGHQ scoring system was used in reverse so that a "1" indicates psychological well-being and a "0" indicates a lack thereof. The higher the score, the better the psychological state. The scale showed high internal consistency (alpha = .80).

CFA for measurement models

Separate confirmatory factor analyses (CFA) were conducted with stressor measures, social support, job control, and each of the outcome measures in order to examine the relationship between each item and the construct of which the item is an indicator. For all items measuring the four job stressors, first a four-factor model was specified as original measures indicated. Since this first model fit the data poorly (model fit indices and criteria are discussed in the next section), the model was modified to explore a better fit. More specifically, for Mental Demand items two factors instead of one were modeled: one representing divided attention, the other vigilance. An item with small r^2 was omitted because it signals that the item was not a good indicator of the latent factor. Some cross-loadings were allowed between workload and role conflict factors. After acceptable model fit was achieved, non-significant paths were eliminated. This trimmed model did not compromise model fit. Therefore, this model was used as the measurement model for stressors in subsequent analyses. The details of this CFA are presented in Appendix B.

All other measures were examined following the same CFA procedure. Measurement models for social support, job control, and job satisfaction all fit the data well (see Appendix B). One of the outcome variables, the Stress-in-General Scale (Stanton et al., 2001), was supposed to measure one latent factor of global job strain. However, this one-factor model fit the data poorly. Examining the residual matrix, factor loadings, and r^2 did not suggest theoretically defensible model modifications. Since the original authors did not provide suggestions for any other factor models, a measurement model for the 12 items in this scale was not explored further. Individuals' scores were

calculated as the sum of the 12 items. Another outcome variable, the GHQ-12, was scored dichotomously as discussed above. Since CFA is not appropriate for dichotomous variables, and the original authors did not suggest any specific factor structure, CFA was not conducted for the 12 items. Individuals' scores were calculated as the sum of the 12 items, with higher scores indicating better psychological states. Table 3.3 presents the items for all variables based on the CFA results.

Variable	Item	Response options	Cronbach alpha
Workload [a]	1 Your job requires you to work very hard 2 Your job requires you to work very fast 3 A great deal to be done 4 *Too many different things to do at work (Cross loading on Role conflict)	(1) Never (2) Rarely (3) Sometimes (4) Often (5) Almost all the time	.75
Role Conflict [a]	1 Do things that are apt to be accepted by one person and not accepted by others 2 Do things on the job that are against your better judgment 3 Feel pressure to do things that you think may not be best 4 Receive conflicting requests from two or more people 5 *Your job leaves you with little time to get things done 6 Have to bend or break a rule or policy to carry out an assignment 7 *Too many different things to do at work (Cross loading on Workload)	(1) Never (2) Rarely (3) Sometimes (4) Often (5) Almost all the time	.84
Role Ambiguity [a]	1 Know exactly what is expected of you on your job (R) 2 Have a clear explanation about what has to be done on your job (R) 3 Know your job responsibilities (R) 4 Clear, planned goals and objectives for your job (R)	(1) Not at all (2) Just a little (3) A moderate amount (4) Quite a bit (5) A very great deal	.73
Vigilance [a,b]	1 *Watch for things going wrong 2 *Your job requires a great deal of concentration 3 *Your work need your undivided attention 4 *Keep your mind on your work at all times 5 *React quickly to prevent problems	(1) Not at all (2) Just a little (3) A moderate amount (4) Quite a bit (5) A very great deal	.72
Divided Attention [a,b]	1 *Job require you to remember many different things 2 *Keep track of more than one thing at a time	(1) Not at all (2) Just a little (3) A moderate amount (4) Quite a bit (5) A very great deal	.63

[a] Adapted from NIOSH GJSQ (Hurrell & McLaney, 1988)
[b] Adapted from the Job Demand and Control Scale (Jackson, Wall, Martin, & Davids, 1993)
* item used as an indicator for a variable different from the intended by the original authors

Continued

Table 3.3: All variables and items used in the study (except for fairness items)

Table 3.3 continued

Variable	Item	Response options	Cronbach alpha
Social Support from coworkers[a]	1 How much do other people at work go out of his way to do things to make your work life easier for you? 2 How easy is it to talk with other people at work? 3 How much can other people at work be relied on when things get tough at work? 4 How much are other people at work willing to listen to your personal problems?	Not at all A little Somewhat Very much	.78
Job Control[a]	1 How much influence do you have over the variety of tasks you do at work? 2 How much influence do you have over the order in which you do tasks at work? 3 How much influence do you have over the amount of work you do? 4 How much influence do you have over the pace of your work, that is, how fast or slow you work? 5 To what extent can you do your work ahead and take a short rest break during work hours? 6 In general, how much influence do you have over how you do your work?	Not at all Just a little A moderate amount Quite a bit (5) A very great deal	.74

[a] Adapted from NIOSH GJSQ (Hurrell & McLaney, 1988)

Continued

Table 3.3 continued

Variable		Item	Response options	Cronbach alpha
Job satisfaction [a]	1	Knowing what you know now, if you had to decide all over again whether to take the type of job you now have, what would you decide?	I would… (1) decide without hesitation to tale the same type of job (2) Have some second thoughts (3) Decide definitely NOT to take the same type of job	.80
	2	If you were free right now to go into any job you wanted, what would your choice be?	I would … (1) Take the same job (2) take a different job	
	3	If a friend of yours told you he was interested in working in a job like yours, what would you tell him?	I would … (1) strongly recommend it (2) have doubts about recommending it (3) advice against it	
	4	All in all, how satisfied would you say you are with your job?	(1) Very satisfied (2) Somewhat satisfied (3) Not too satisfied (4) Not at all satisfied	
Global job strain [c]		*"Think of your job in general. All in all, what is it like most of the time?"*		.90
	1	Demanding	(1) Yes (2) No (3) I cannot decide	
	2	Pressured		
	3	Hectic		
	4	Calm		
	5	Relaxed		
	6	Many things stressful		
	7	Pushed		
	8	Irritating		
	9	Under control		
	10	Nerve-wracking		
	11	Hassled		
	12	Comfortable		

[a] Adapted from NIOSH GJSQ (Hurrell & McLaney, 1988)
[c] Adapted from the Job-in-General Scale (Stanton et al., 2001)

Continued

Table 3.3 continued

Variable		Item	Response options	Cronbach alpha
Psychological well-being [d]	1	Over the past few weeks, have you been able to concentrate on whatever you're doing?	For Item 1, (1) Better than usual (2) Same as usual (3) Less than usual (4) A little more than usual	.80
	2	Over the past few weeks, have you lost much sleep due to worry?		
	3	Over the past few weeks, have you felt that you are playing a useful part in things?	For Items 2, 5, 6, 9,and 10, (1) Not at all (2) No more than usual (3) A little more than usual (4) Much more than usual	
	4	Over the past few weeks, have you felt capable of making decisions about things?		
	5	Over the past few weeks, have you felt constantly under strain?		
	6	Over the past few weeks, have you felt you couldn't overcome your difficulties?	For Items 3, 4, 7, 8, and 12, (1) More so than usual (2) Same as usual (3) Less so than usual (4) Much less than usual	
	7	Over the past few weeks, have you been able to enjoy your normal day-to-day activities?		
	8	Over the past few weeks, have you been able to face up to your problems?		
	9	Over the past few weeks, have you been feeling unhappy and depressed?		
	10	Over the past few weeks, have you been losing your confidence in yourself?		
	11	Over the past few weeks, have you been thinking of yourself as a worthless person?		
	12	Over the past few weeks, have you been feeling reasonably happy, all things considered?		

[d] Adapted from the General Health Questionnaire (GHQ-12, Goldberg & Williams, 1988)

3.4 Data Analysis Overview

The following two chapters present results of the data analysis. First, measurement models for fairness at work were explored using confirmatory factor analysis. Then the relationships between fairness and employee well-being were examined while job stressors, job control, and social support from coworkers were controlled for. First, the main effect of fairness was tested by adding fairness variables one by one to regression models. If a stressor variable had a significant regression weight in the final model, the interaction term between the stressor and fairness variables was added to examine the moderation effect of fairness. The mediating effect of fairness was tested according to the procedure recommended by Baron and Kenny (1986). The detail of this procedure was described in Chapter 5.

Before these chapters, some issues regarding data analysis procedures need to be discussed: namely, treatment of missing data, model fit indices, factor score estimates, and sample size.

3.4.1 Treatment of Missing data

With a large number of items included in the questionnaire, it is inevitable to have some data points missed by some of the respondents. There are different types of missingness: missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR). The following is a summary of these three types, as explained by Allison (2001). Data are MCAR if the probability of missing does not depend on the value of any variable in the data set. This is the most benign type of missingness, and any method of treating missing data will produce unbiased parameter

estimates. Data are MAR if the probability of missing data on variable X does not depend on the value of X but does depend on the value of some other variable(s) in the data set. For example, if middle age women are less likely to report their age than middle age men, but within the same sex group the missingness does not depend of the age, then the data on age is MAR. The MAR condition cannot be confirmed because, obviously, the values of missed data are not available. In the example above, the age of women who did not report their age is unknown. Thus it is possible that those women are older than the other women who reported their age. If this is the case, the data on age is MNAR because the probability of the missing data on age depends on the age itself. MNAR is a non-ignorable type of missingness, and the missing mechanism must be included in the model. This is also very difficult because MNAR may not be always detected and because the missing mechanism is often hard to know. Therefore in practice, missing data are often assumed to be MAR.

In this study, missing data points were imputed using the Maximum Likelihood (ML) method (Allison, 2001) available in AMOS, the statistical software for structural equation modeling (SEM). The general idea of ML estimation is to produce parameter estimates that maximize the likelihood of reproducing the observed data. When observed data contain some missing data values, the ML approach uses all available information in computing a likelihood function for each case. All likelihood functions are then accumulated across the entire sample and maximized to produce parameter estimates (Allison, 2001).

While most other methods, such as listwise deletion and imputation by multiple regression, require missing values to be MCAR, the ML method assumes missing values

are MAR, a less restrictive assumption (Allison, 2001). If indeed the data are MCAR, the ML method produces better estimates than listwise deletion because the ML method uses all available information, whereas listwise deletion discards cases if one data point is missing. Since MCAR is often not the case, the ML method is preferred to other methods that require MCAR. The ML imputation has been shown as a reliable method in yielding little-biased and efficient parameter estimates even when a large ptoportion of the data is missing. For example, in a simulation study Enders and Bandalos (2001) showed that the ML method encountered few convergence failures and yielded little bias even when 25% of the data was missing. In this study if a respondent had no data point in a model (i.e., the respondent did not answer any of the items included in the model), the respondent was omitted from the analysis.

In sum, the ML method produces efficient and little-biased parameter estimates with a less restrictive assumption on the nature of missingness. The ML imputation is generally considered superior to imputation by listwise deletion, nearest neighbor method, and multiple regression (e.g. Allison, 2001; Enders & Bandalos, 2001; Schafer & Graham, 2002).

In order to take advantage of ML data imputation method, AMOS was used for linear regression analysis. Models were specified as path diagram (i.e., no latent variables), and all variables were allowed to correlated with each other. This representation of linear regression can be considered as a special case of structural equation modeling, where each latent variable has a perfectly corresponding single indicator, and measurement errors are constrained to 0. In this case, the ML estimation

derives identical parameter estimates to ordinary least square (OLS) estimation (Allison, 2001).

3.4.2 Model Fit Index for CFA

Chi-square statistic, root mean square error of approximation (RMSEA), Comparative fit index (CFI), and non-norm fit index (NNFI) were shown as fit indices. Chi-square statistic is the most common fit index, but it has two problems. First, it is sensitive to the sample size. The larger the sample size, the more likely a Type II error. Another problem is that the more complex the model, the more likely the Chi-square statistic will indicate a good fit. When the model is just identified, the Chi-square statistic will indicate a perfect fit.

These problems were dealt with by also using other types of complementary fit indices. RMSEA is a measure of discrepancy per degree of freedom (Browne & Cudeck, 1992), which penalizes for lack of parsimony. General guidelines suggest that RMSEA smaller than .05 indicates close fit, from .05 to .08 reasonable fit, .08 to .10 acceptable fit, and greater than .10 unacceptable fit (Browne, 2002; MacCallum, 2001).

While RMSEA is an absolute measure of goodness of fit, NNFI and CFI are both incremental fit measures. They compare the model of interest with the worst model possible, that is, a model with no latent variables explaining the covariance among the measured variable. NNFI is a Type 2 incremental fit index, which assumes a chi-square distribution with the degrees of freedom of the model of interest, and CFI belongs to Type 3, which assumes a noncentral chi-square distribution (Hu & Bentler, 1999). For

both indices, a value of .90 or higher indicates acceptable fit, .94 or higher good fit (Hu & Bentler, 1999).

Two nested models were compared using the Chi-square difference test (MacCallum, 2001). This test assesses whether the more parsimonious model (B) fits the data as well as the less parsimonious model (A). If the goodness of the model fit is the same, the more parsimonious model is preferred. The test statistic is

$$\chi^2_{B-A} = (N-1)F\hat{}_B - (N-1)F\hat{}_A$$

where N is the sample size, and F^ is the sample discrepancy function value for each model. Under the null hypothesis that the fit of the two models are the same, the test statistic follows the Chi-squared distribution with the degree of freedom of the difference in the degrees of freedom for Model A and B. If the test statistic does not exceed the critical value, the null hypothesis cannot be rejected (i.e., I conclude that the more parsimonious model does not fit as well as the less parsimonious model). This way the more parsimonious model will be identified without compromising the model fit.

For non-nested models, ECVI (expected cross validation index) was used for comparison. Since ECVI reflects errors in estimating a large number of parameters, it penalizes for lack of parsimony (Browne & Cudeck, 1992). This characteristic is especially useful when the sample size is not large (Browne, 2002), as in this study. ECVI does not have a threshold value; instead, a smaller value indicates better fit.

3.4.3 Factor score estimates

A factor score estimate is a numerical value that is meant to indicate an individual's relative standing on a latent factor (Grice, 2001). It is calculated as a

weighted sum of standardized scores of all observed variables included in a CFA model. The weights reflect all factor loadings as well as inter-factor correlations. Since factor score estimates do not take measurement error into account, the value is an imperfect approximation of the true factor score, which cannot be obtained.

Some researchers recommend not using factor score estimates (e.g., Browne, 2002; MacCallum, 2001) because SEM allows estimating relationships among latent variables without calculating such approximation. In this study, however, factor score estimates were used because the sample size of 357 was not sufficient to conduct SEM to obtain stable parameter estimates. Instead, multiple linear regression analysis was conducted. The regression results using the factor score estimates, therefore, should be interpreted with the notion of measurement errors not being accounted for.

3.4.4 Sample size

The sample size for CFA is an issue of statistical power, or the ability to reject a null hypothesis when it is incorrect. The following procedure is adopted from MacCallum and colleagues (MacCallum, Browne, & Sugawara, 1996). In general, power analysis requires the null hypotheses, an effect size, and the level of α. The hypothesis testing in CFA is based on RMSEA: the null hypothesis is that the population value of RMSEA is .05 or smaller ($\varepsilon \leq .05$; the test of close fit). The effect size is also expressed in terms of RMSEA. Since RMSEA of .08 or greater indicates less than reasonable fit, one wishes to reject the null hypotheses when the population value of RMSEA is .08 or greater. The level of α is set as .05. Statistical power in CFA also depends on the degrees of freedom, or the difference between the number parameters to be estimated and

the number of unique components of the covariance matrix. As presented in the next two chapters, the degrees of freedom in the models tested in this study exceeds 100. With this high degrees of freedom, power is virtually 1.000 (see Table 3.4).

	Sample size				
df	100	200	300	400	500
80	.570	.911	.988	.999	1.000
90	.612	.937	.994	1.000	1.000
100	.650	.955	.997	1.000	1.000

Note. All power estimates are based on α =.05, ε_0 = .05 (test of close fit), and ε_1 = .08.

Table 3.4: Power estimates for various degrees of freedom and sample size. This table was adapted from MacCullam, Browne, and Sugawara (1996).

CHAPTER 4

FAIRNESS AT WORK: ITS UNDERLYING STRUCTURE

In this chapter, the underlying structure of employees' fairness perceptions was explored using confirmatory factor analysis. First, employees' perceptions of their supervisor's fairness were examined. After a factor structure was determined, the empirical overlap between supervisory fairness and social support was analyzed. Upper management's fairness was examined based on the factor structure of supervisor fairness.

4.1 Supervisor Fairness

4.1.1 Item distribution and missingness

Of the 24 items developed for assessing fairness of the supervisor, five items were excluded from the analysis. The item, "To what extent is your supervisor concerned about paying employees what they deserve?", was omitted because a number of participants reported during the data collection that it was hard to answer since the supervisor did not decide how much employees should be paid. The items "Supervisor treats employees differently based on their race", "Supervisor treats employees like children", "Supervisor yells at employees", and "Supervisor lies to employees" were excluded because of extremely skewed distributions (i.e., median was 1).

Table 4.1 is a frequency table of the number of data points. While nearly 90% of the participants answered all 19 items, 15 participants did not answer any of the supervisor fairness items. Of the 15, 12 had limited literacy and were not able to provide the information even in an in-person interview. The other three had various reasons for not answering the entire section. One employee said that he had two supervisors and could not choose one answer. Another employee participated in the study on his first day of work and thus could not assess his supervisor. The last one refused to answer fairness questions and did not want to reveal the reason. These 15 participants who did not answer any of the questionnaire items regarding the supervisor's fairness were excluded in the CFA for the supervisor fairness construct.

Number of data points	Frequency	Percent
0	15	4.20
6	1	0.28
7	1	0.28
11	1	0.28
12	1	0.28
16	1	0.28
17	5	1.40
18	16	4.48
19	316	88.52
Total	357	100.00

Table 4.1: Number of data points in the Supervisor Fairness items

Table 4.2 shows descriptive statistics for the 19 items. Sixteen items had a missing rate of about 1% or less. For three items with the highest missing rates, the

Flesch-Kincaid Grade Level score[4] was 12.7 while the score for the other 16 items was 8.2. If the participants missed these three items more often than other items because of the complexity of the questions, it is likely that the data is missing at random (MAR), or the missingness does not depend on the answers to the missed items. Therefore, the maximum likelihood imputation is considered appropriate.

As shown in Table 4.2, items describing negative behaviors have lower endorsement than positive ones. The lowest mean was for "the supervisor makes unreasonable demands" (1.964). As mentioned above, the four items were excluded from the analysis because of extremely skewed distribution (i.e., more than 50% of the participants responded 1 "not at all"). They are also items describing negative behaviors. Negative behaviors were not reported as frequently as positive behaviors. The lowest mean among the items describing positive behaviors was for "the supervisor cares if employees are satisfied with their jobs" (2.826), which is higher than the highest mean among the items describing negative behaviors ("the supervisor plays favorites", 2.488).

[4] Flesch-Kincaid Grade level score = (.39 x ASL) + (11.8 x ASW) – 15.59
Where ASL = average sentence length (the number of words divided by the number of sentences) ASW = average number of syllables per word (the number of syllables divided by the number of words)

Items *To what extent does your immediate supervisor…?*	N	# missed (excl.15)	% missed	Mean	Std. Deviation	Skewness	Kurtosis
Appreciate extra effort from employees (p)	341	1	.29	3.370	1.260	-0.271	-0.957
Appreciate employees' hard work (p)	341	1	.29	3.337	1.272	-0.291	-0.966
Available to help when an employee has a problem (p)	341	1	.29	3.320	1.183	-0.266	-0.887
Treat employees with respect (p)	341	1	.29	3.496	1.167	-0.330	-0.893
Understand when an employee is absent due to a personal problem (p)	340	2	.58	3.347	1.268	-0.326	-0.888
Blame employees for things that are not their fault or are outside their control (n)	339	3	.88	2.044	1.192	0.979	-0.013
Praise employees for good work (p)	339	3	.88	2.962	1.239	0.073	-1.008
Notice if an employee does the best job possible (p)	339	3	.88	3.206	1.184	-0.159	-0.862
Care about employees' opinions (p)	339	3	.88	2.988	1.197	0.054	-0.886
Concerned about employee well-being (p)	339	3	.88	3.198	1.194	-0.114	-0.926
Care if employees are satisfied with their jobs (p)	339	3	.88	2.826	1.262	0.083	-1.024
Ignore employees complaints (n)	339	3	.88	2.342	1.234	0.591	-0.683
Ignore employees' suggestions (n)	338	4	1.17	2.423	1.271	0.710	-0.515
Play favorites (n)	338	4	1.17	2.488	1.400	0.553	-1.010
Make unreasonable demands of employees (p)	338	4	1.17	1.964	1.086	1.021	0.257
Willing to help employees when they need a special favor (p)	338	4	1.17	3.083	1.186	-0.043	-0.831
Take advantage of employees if given opportunities (n)	334	8	2.34	2.048	1.241	0.970	-0.209
Care more about making a profit than about employee well-being (n)	334	8	2.34	2.081	1.318	0.966	-0.334
When making decision, disregard the consequences on employees (n)	331	11	3.22	2.121	1.146	0.881	0.064

(n) Items describing negative behaviors
(p) Items describing positive behaviors

Table 4.2: Descriptive statistics for Supervisor Fairness Items

4.1.2 CFA model for Supervisor Fairness

As described in the previous chapter, fairness items in this study were developed based on a qualitative study. An inductive approach was taken in modeling confirmatory factor models. First, using 19 cards each of which has one of the 19 items, two people (Catherine Heaney and Kaori Fujishiro) individually sorted the items into groups. The two sorters did not predetermine the number of groups or specific concepts under which cards were to be sorted. Rather, they tried to organize them according to emerging patterns. This card sorting was similar to a type of qualitative data analysis called pattern-level analysis (LeCompte & Schensul, 1999), in which the researcher explores various ways of relating items to one another without depending on pre-determined categories.

The number of groups and constituent items were agreed between the two sorters. A confirmatory factor model was specified according to this card-sorting result (shown in Table 4.3). Factor 1 represents the supervisor's treating employees in ways that they do not deserve. Factor 2 represents the supervisor's expressions of appreciation for employees' efforts and accomplishment. Factor 3 reflects a lack of receptivity to employees' perspectives. Factor 4 is the supervisor's support for employees' personal problems and needs. Lastly, Factor 5 represents the supervisor's general concern and caring for employee well-being.

Factor	Item *To what extent does your immediate supervisor …?*	Factor loading	S.E.	Std. factor loading	p	r^2
1 Unbiased and respectful treatment of employees	Treat employees with respect (R)	-1.004	0.070	-0.802	<.001	0.721
	Take advantage of employees if given opportunities	1.000		0.768		0.662
	Blame employees for things that are not their fault or are outside their control	0.900	0.063	0.699	<.001	0.561
	Play favorites	0.862	0.076	0.580	<.001	0.392
	Make unreasonable demands of employees	0.782	0.055	0.684	<.001	0.561
2 Recognition of employee efforts	Appreciate employees' hard work	1.000		0.797		0.704
	Appreciate extra effort from employees	0.933	0.057	0.751	<.001	0.633
	Praise employees for good work	0.927	0.055	0.766	<.001	0.660
	Notice if an employee does the best job possible	0.912	0.052	0.781	<.001	0.688
3 Receptivity to employee voice	Care about employees' opinions	1.000		0.811		0.736
	When making decision, disregard the consequences on employees	-0.727	0.067	-0.622	<.001	0.474
	Ignore employees' suggestions	-0.849	0.073	-0.646	<.001	0.486
	Ignore employees complaints	-0.851	0.070	-0.674	<.001	0.529
4 Willingness to help with problems/special circumstances	Available to help when an employee has a problem	1.000		0.769		0.671
	Willing to help employees when they need a special favor	0.747	0.068	0.570	<.001	0.404
	Understand when an employee is absent due to a personal problem	0.733	0.073	0.523	<.001	0.342
5 Concern about employee well-being	Concerned about employee well-being	1.000		0.810		0.735
	Care if employees are satisfied with their jobs	0.987	0.057	0.751	<.001	0.634
	Care more about making a profit than about employee well-being	-0.922	0.075	-0.660	<.001	0.497

Table 4.3: CFA results for supervisor fairness items

Factor	F1	F2	F3	F4	F5
1 Unbiased and respectful treatment of employees	1.000				
2 Recognition of employee efforts	-0.917	1.000			
3 Receptivity to employee voice	-0.895	0.854	1.000		
4 Willingness to help with problems/special circumstances	-0.894	0.926	0.927	1.000	
5 Concern about employee well-being	-0.969	0.939	0.918	0.920	1.000

Table 4.4: Supervisor fairness inter-factor correlation.

A "method factor" was included in the model to represent response bias. Of the 19 items, eight described the supervisor's negative behaviors (e.g., "The supervisor ignores employees' complaints.") while eleven described positive behaviors (e.g., "The supervisor treats employees with respect."). The response options were identical for both types and vertically arranged under each question: from the top, "not at all", "just a little", "somewhat", "quite a bit", and "to a great extent" at the bottom. There may be a tendency for the respondent to choose the "not at all" response at the top regardless of the content of the item. This response bias would influence all items equally and would not likely be correlated with other latent factors (O'Muircheartaigh, Krosnick, & Helic, 1999). The factor loadings for this method factor were constrained to be equal, and covariances between the method factor and other factors were constrained to be zero.

This model with five fairness factors and one method factor fit the data well (Chi-square = 317.258, df = 141, $p<.001$; IFI = .957; NNFI = .941; RMSEA = .061, 90%CI [.052, .069]). Factor loadings on the five fairness latent factors were in the expected direction, of substantial magnitude, and highly significant (Table 4.3). Factor loadings on the method factor were smaller in magnitude compared to the factor loadings on the fairness factors, but statistically significant ($b = -.331$, $p<.001$).

The five factors representing different aspects of supervisor fairness were highly correlated to each other (Table 4.4). In order to examine whether or not these five factors were better considered as one factor, an alternative model was fit to the data. This model included one factor representing supervisor fairness and a method factor representing the response bias discussed above. All 19 items had loadings on both factors. Loadings to the method factor were constrained to be equal, and covariance between the two factors was constrained to be zero. The alternative model fit the data reasonably well (Chi-square = 392.524, df = 151, $p<.001$; IFI = .940; NNFI = .924; RMSEA = .068, 90%CI [.060, .077]); however, all fit indices suggested the first model fit the data better. ECVI, a fit index that can be used comparing non-nested models, also showed that the first model was a better one (1.329 vs. 1.491). Thus, although highly correlated, the five fairness factors better represent the data than one factor.

The chi-square difference test was used to determine whether or not any two highly correlated factors should be considered as one factor. In other words, a hypothesis that the true correlation between the two factors was 1.000 was examined. First, the 9 indicators for Factor 1 and Factor 5 were separated from the other items. Two models were fit to the data from the 9 items: a two-factor model, specified as Factor 1 and Factor 5 in the original model, and a one-factor model in which all 9 items had loadings to the same factor. The difference between the two resulting Chi-square statistics (df = 1) was used as a test statistic. For Factor 1 and Factor 5, the Chi-square difference was 8.818 ($p<.001$); that is, the correlation between the two factors was significantly different from 1. The same procedure was used to test all pairs of the five factors. The Chi-square differences ranged from 8.818 ($p = .003$) for F1 and F5 to 16.913 ($p<.001$) for Factor 2

and Factor 3. Therefore, it was concluded that although highly correlated, the five factors were better considered as separate.

4.1.3 Supervisor Fairness and Social Support

Many of the supervisor fairness items describe supportive behaviors, and the five aspects of supervisor fairness identified above are characteristics of social support discussed in the literature. Social support from the supervisor was measured with four items separate from supervisor fairness: "How much does your boss go out of his way to do things to make your work life easier for you?", "How easy is it to talk with your boss?", "How much can your boss be relied on when things get tough at work?", and "How much is your boss willing to listen to your personal problems?" Whether or not social support from the supervisor measured with these four items can be considered as part of the supervisor's fairness behavior was examined by fitting two CFA models to the data.

For the 19 fairness items and 4 social support items, the first model (Model 1) was specified so that social support is a separate construct from any of the five supervisor fairness factors, although it is correlated with all of them. In this model, there were five fairness factors, one social support factor, and one method factor accounting for response bias discussed above. All but the method factor were allowed to be correlated to each other.

A second model (Model 2) was specified as a 6-factor model (i.e., five fairness factors and one method factor). Rather than modeling the four social support items as indicators of one common factor, each social support item was examined and identified

as an indicator for one of the five fairness factors. A social support item, "how easy is it to talk with your boss?" was included as an indicator for Factor 3, which represents employees' perceptions of the supervisor's receptivity to their voice. Two social support items, "how much is your boss willing to listening to your personal problems?" and "how much does your boss go out of his way to make your work life easier for you?", were included as indicators for Factor 4, which represents that the supervisor cares about employees' personal needs and concerns. Another social support item, "how much can your boss be relied on when things get tough at work?", was included as an indicator for Factor 5, which represents the supervisor's concern about employees' job-related well-being (shown in Table 4.5). In order to account for sentence structure differences between these four social support items and the fairness items, the error variances of the social support items were allowed to be correlated to each other.

Model 1 did not yield an admissible solution because the covariance matrix of the six factors (i.e., five fairness factors and one social support factor) was not positive definite. The correlations between the social support factor and other five factors were all practically 1.00. Model 2, on the other hand, did provide an admissible solution (Table 4.5). Model fit was good (Chi-square = 474.193, df = 213, $p<.001$; IFI = .948; NNFI = .931; RMSEA = .060, 90%CI [.053, .067]). As shown in Table 4.5, all factor loadings were in the expected direction, substantial in magnitude, and statistically significant. Factor loadings for the supervisor fairness items were changed little by including the four social support items.

Factor	Items *To what extent does your immediate supervisor …?*	Factor loading	S.E.	Std. Factor loading	p	r^2
1 Unbiased and respectful treatment of employees	Take advantage of employees if given opportunities	1		0.771		0.658
	Treat employees with respect	-0.988	0.068	-0.803	<.001	0.715
	Blame employees for things that are not their fault or are outside their control	0.898	0.062	0.704	<.001	0.562
	Play favorites	0.869	0.076	0.588	<.001	0.394
	Make unreasonable demands of employees	0.780	0.055	0.689	<.001	0.558
2 Recognition of employee efforts	Appreciate employees' hard work	1		0.798		0.698
	Appreciate extra effort from employees	0.935	0.057	0.753	<.001	0.629
	Praise employees for good work	0.927	0.055	0.765	<.001	0.651
	Notice if an employee does the best job possible	0.917	0.052	0.787	<.001	0.689
3 Receptivity to employee voice	Care about employees' opinions	1		0.794		0.700
	Ignore employees' suggestions	-0.876	0.072	-0.678	<.001	0.526
	Ignore employees complaints	-0.867	0.075	-0.645	<.001	0.477
	When making decision, disregard the consequences on employees	-0.753	0.068	-0.628	<.001	0.472
	Easy to talk with (SS)	0.649	0.054	0.595	<.001	0.447
4 Willingness to help with problems/special circumstances	Available to help when an employee has a problem	1		0.749		0.633
	Willing to listen to your personal problems (SS)	0.772	0.06	0.642	<.001	0.500
	Go out of his way to do things to make your work life easier for you (SS)	0.764	0.057	0.657	<.001	0.526
	Willing to help employees when they need a special favor	0.754	0.069	0.561	<.001	0.385
	Understand when an employee is absent due to a personal problem	0.729	0.075	0.506	<.001	0.318
5 Concern about employee well-being	Concerned about employee well-being	1		0.807		0.722
	Care if employees are satisfied with their jobs	0.999	0.058	0.758	<.001	0.637
	Care more about making a profit than about employee well-being	-0.934	0.076	-0.664	<.001	0.495
	Can be relied on when things get tough at work (SS)	0.619	0.051	0.578	<.001	0.429

(SS) indicates items from the social support measure (Hurrell & McLaney, 1988).

Table 4.5: CFA results for Model 2 including both the supervisor fairness and social support items.

Table 4.6 is a correlation matrix for the five fairness factors. All factors are highly correlated. Fitting a model with fairness as one factor did fit the data adequately (Chi-square = 559.642, df = 223, p<.001; IFI = .933; NNFI = .916; RMSEA = .067, 90%CI [.060, .073]), but all fit indices suggested Model 2 with fairness as five factors fit better. ECVI also showed Model 2's better fit (1.895 vs. 2.087).

Factor	F1	F2	F3	F4	F5
1 Unbiased and respectful treatment of employees	1.000				
2 Recognition of employee efforts	-0.911	1.000			
3 Receptivity to employee voice	-0.912	0.860	1.000		
4 Willingness to help with problems/special circumstances	-0.941	0.934	0.971	1.000	
5 Concern about employee well-being	-0.963	0.944	0.921	0.937	1.000

Table 4.6: Supervisor fairness inter-factor correlation for Model 2.

4.1.4 Supervisor Fairness and Job Control

Correlations between the five supervisor fairness factors and job control were examined in a similar procedure used for the relationships between supervisor fairness and social support. Six items measuring job control were included as indicators of a job control factor in the supervisor fairness model with social support items. The job control factor was allowed to correlate with all five fairness factors. A possibility that job control was better to be considered as part of fairness was examined by fitting an alternative model in which all fairness and job control items were indicators of one factor. The goodness of fit for this alternative model was compared to that for a model with fairness as one factor. As presented in the previous section, the model with fairness as one factor fit the data adequately.

The model fit for the first model was good (Chi-square = 677.872, df = 349, p<.001; IFI = .940; NNFI = .925; RMSEA = .053, 90%CI [.047, .058]), but the model fit for the second model was not acceptable (Chi-square = 913.894, df = 364, p<.001; IFI = .899; NNFI = .879; RMSEA = .067, 90%CI [.061, .72]). These model fit indices indicated poorer fit than the model with fairness as one factor without the job control items in the previous section. This result indicates that job control was better considered as a correlated but separate factor from supervisor fairness.

Table 4.7 shows the correlation matrix for the five supervisor fairness factors and job control factor. Job control was significantly correlated with all of the fairness factors, but the magnitude of correlation was moderate.

Factor	F1	F2	F3	F4	F5	Job Control
1 Unbiased and respectful treatment of employees	1.000					
2 Recognition of employee efforts	-0.909	1.000				
3 Receptivity to employee voice	-0.913	0.860	1.000			
4 Willingness to help with problems/special circumstances	-0.940	0.935	0.972	1.000		
5 Concern about employee well-being	-0.962	0.944	0.922	0.937	1.000	
Job Control	-0.212	0.269	0.312	0.282	0.283	1.000

Table 4.7: Inter-factor correlation for supervisor fairness and job control

4.2 Upper Management Fairness

4.2.1 Item distribution and missingness

Most of the items asking about employees' perceptions of upper management's fairness behavior were the same as the supervisor items. One item, however, was asked

only about upper management: "If the company earned more profit, would upper management consider increasing employee salaries?" Of the 25 items, two were excluded from the following analysis due to highly skewed distributions. More than half of the participants marked "Not at all (1)" on "Does upper management treat employees differently based on their race?" (66.4%) and "Does upper management yell at employees?" (55.3%).

Table 4.8 shows the frequency of the number of data points in the 23 items. While 303 respondents (85%) provided complete data, 20 participants did not answer any of the 23 items. Of the 20, 14 did not answer the supervisor items either due to limited literacy levels, and other reasons described above. One employee with two bosses answered the management items. Six participants answered the supervisor items but not upper management items. They all reported the same reason: they did not have any contact with upper management and therefore did not feel that they could rate upper management's behavior.

Number of data points	Frequency	Percent
0	20	5.60
3	1	0.28
6	2	0.56
9	1	0.28
17	2	0.56
18	2	0.56
20	4	1.12
21	9	2.52
22	13	3.64
23	303	84.87
Total	357	100.00

Table 4.8: Number of data points in the management fairness items

Table 4.9 shows descriptive statistics for the 23 items. The rate of missing data is generally low but slightly higher than the supervisor items. The rank-order of the missingness is similar between the two sets of items. More missed items tend to have more complicated sentences than less missed items. Thus, the reason for missing is most likely the readability level. One exception is the most missed item, "Does upper management lie to employees?" During data collection, many participants commented on this item. They said that if management was good at lying, employees would not know. If this was the reason for missing this item, then the missingness may depend on the level of the answer. Those who chose not to answer the item may have higher suspicion about management than those who answered the item (about 70% answered "Not at all" or "Just a little"). This possibility of not-missing-at-random (NMAR) should be considered when interpreting the results.

Items *To what extent does upper management …?*	N	# missed (excl.20)	% missed	Mean	Std. Deviation	Skewness	Kurtosis
Appreciate extra effort from employees	336	1	0.3%	2.652	1.217	0.382	-0.735
Appreciate employees' hard work	335	2	0.6%	2.743	1.204	0.298	-0.782
Praise employees for good work	334	3	0.9%	2.605	1.160	0.487	-0.529
Understand when an employee is absent due to a personal problem	334	3	0.9%	2.880	1.219	0.121	-0.937
Notice if an employee does the best job possible	334	3	0.9%	2.686	1.131	0.328	-0.597
Available to help when an employee has a problem	334	3	0.9%	2.784	1.142	0.309	-0.650
Blame employees for things that are not their fault or are outside their control	333	4	1.2%	2.180	1.211	0.857	-0.201
Treat employees with respect	333	4	1.2%	3.165	1.169	-0.075	-0.851
Care about employees' opinions	332	5	1.5%	2.539	1.130	0.509	-0.420
Make unreasonable demands of employees	332	5	1.5%	2.271	1.186	0.730	-0.390
Willing to help employees when they need a special favor	332	5	1.5%	2.693	1.159	0.350	-0.740
Ignore employees' suggestions	331	6	1.8%	2.740	1.288	0.349	-0.969
Concerned about employee well-being	331	6	1.8%	2.876	1.226	0.228	-0.918
Play favorites	331	6	1.8%	2.505	1.374	0.491	-1.014
Ignore employees' complaints	331	6	1.8%	2.508	1.209	0.541	-0.635
Care more about making a profit than about employee well-being	330	7	2.1%	2.715	1.407	0.338	-1.168
Consider increasing employee salaries if the company earns more profit	330	7	2.1%	1.800	0.963	1.274	1.349
Concerned about paying employees what they deserve	330	7	2.1%	2.021	1.059	0.993	0.428
Care if employees are satisfied with their jobs	329	8	2.4%	2.526	1.215	0.448	-0.717
Take advantage of employees	329	8	2.4%	2.389	1.302	0.574	-0.810
Treat employees like children	329	8	2.4%	2.003	1.206	1.117	0.286
When making decisions, disregard the consequences on employees	327	10	3.1%	2.407	1.207	0.663	-0.415
Lie to employees	321	16	5.0%	2.153	1.259	0.937	-0.192

Table 4.9: Descriptive statistics for 23 management fairness items

4.2.2 CFA model for Management fairness

The card sorting procedure was repeated with the 23 items on management fairness to specify the CFA model. The resulting categories and items under each category were the same as the supervisor items, except for the additional 4 items. "Management treats employees like children" and "management lies to employees" were categorized under Factor 1 representing management's behaviors that employees do not deserve. Two other items regarding pay formed a new factor representing management's concern about fair wages. Together, management fairness behaviors were inductively categorized into six groups: (1) behaviors that employees do not deserve, (2) expressions of appreciation and recognition, (3) receptivity to employees' voice, (4) management's concern about employees' personal problems and needs, (5) management's concern about employees' job-related well-being, and (6) management's concern about paying a fair wage (Table 4.10).

A CFA model was specified according to this card-sorting result. A method factor was specified in the same way described in the supervisor fairness CFA model. The model fit was good (Chi-square = 443.245, df = 214, $p<.001$; IFI = .951; NNFI = .937; RMSEA = .056, 90%CI [.049, .064]). Factor loadings on the six fairness latent factors were in the expected direction, of substantial magnitude, and highly significant (Table 4.10). Factor loadings on the method factor were smaller in magnitude compared to the factor loadings on the fairness factors, but statistically significant ($b = -.328$, $p<.001$).

Factor	Item *To what extent does upper management …?*	Factor loading	S.E.	Stand. factor loading	p	r^2
1 Unbiased and respectful treatment of employees	Take advantage of employees	1.000		0.776		0.665
	Treat employees with repsect	-0.917	0.065	-0.787	<.001	0.697
	Play favorites	0.868	0.069	0.635	<.001	0.460
	Lie to employees	0.859	0.062	0.689	<.001	0.542
	Treat employees like children	0.813	0.060	0.671	<.001	0.523
	Blame employees for things that are not their fault or are outside their control	0.804	0.061	0.655	<.001	0.501
	Make unreasonable demands of employees	0.791	0.060	0.657	<.001	0.505
2 Recognition of employee efforts	Appreciate employees' hard work	1.000		0.844		0.788
	Appreciate extra effort from employees	0.982	0.048	0.824	<.001	0.757
	Praise employees for good work	0.839	0.047	0.754	<.001	0.651
	Notice if an employee does the best job possible	0.784	0.048	0.711	<.001	0.589
3 Receptivity to employee voice	Care about employees' opinions	1.000		0.798		0.722
	Ignore employees' suggestions	-0.989	0.081	-0.692	<.001	0.545
	Ignore employees' complaints	-0.962	0.075	-0.726	<.001	0.603
	When making decisions, disregard the consequences on employees	-0.601	0.077	-0.457	<.001	0.287
4 Willingness to help with problems/special circumstances	Available to help when an employee has a problem	1.000		0.738		0.630
	Understand when an employee is absent due to a personal problem	0.955	0.080	0.653	<.001	0.499
	Willing to help employees when they need a special favor	0.907	0.076	0.645	<.001	0.495
5 Concern about employee well-being	Care more about making a profit than about employee well-being	-1.283	0.096	-0.803	<.001	0.696
	Care if employees are satisfied with their jobs	1.029	0.068	0.774	<.001	0.674
	Concerned about employee well-being	1.000		0.737		0.614
6 Fairness regarding wage	Concerned about paying employees what they deserve	1.000		0.846		0.809
	Consider increasing employee salaries if the company earns more profit	0.720	0.070	0.656	<.001	0.540

Table 4.10: CFA results for management fairness items

The six fairness factors were highly correlated (Table 4.11); however, Factor 6, fairness regarding wages, had lower correlations with the other five factors. A model with Factor 1 to 5 as one factor and another factor for fair wage did not fit the data as well (Chi-square = 661.467, df = 228, p<.001; IFI = .908; NNFI = .887; RMSEA = .075, 90%CI [.069, .082]). The six factors represent the respondents' perceptions of fairness behaviors of upper management better than two fairness factors.

Factor	F1	F2	F3	F4	F5	F6
1 Unbiased and respectful treatment of employees	1.000					
2 Recognition of employee efforts	-0.862	1.000				
3 Receptivity to employee voice	-0.879	0.852	1.000			
4 Willingness to help with problems/special circumstances	-0.832	0.774	0.885	1.000		
5 Concern about employee well-being	-0.879	0.840	0.845	0.840	1.000	
6 Fairness regarding wage	-0.606	0.517	0.591	0.498	0.693	1.000

Table 4.11: Inter-factor correlations among management fairness factors

4.3 Discussion

In this analysis, the underlying structure of fairness at work was identified. Five factors common to both supervisor and management fairness as well as one additional factor for management fairness emerged from the inductive analysis of the questionnaire items. The CFA results indicated that the five- or six-factor structure was plausible. The five factors were highly correlated but better represented the data as separate factors rather than one. Factor 1 reflects the supervisor/management's treating employees in ways that they do not deserve, such as taking advantage of employees, not treating them with respect, blaming them for things outside of their control. Factor 2 was indicated by

items regarding the supervisor/management's appreciating and recognizing good work. Factor 3 reflects the supervisor or management's taking employees' viewpoints into account in decision making. Factor 4 represents the supervisor/management's willingness to accommodate employees' personal needs. Lastly, Factor 5 reflects the supervisor/management's concern about employees' work-related well-being.

For fairness of upper management, a sixth factor was identified in addition to the five factors. Factor 6 represents management's concern about paying fair wages. In the following discussion, these six aspects of fairness at work will be compared with the three organizational justice constructs—distributive, procedural, and interactional justice.

The factors identified in this study do not correspond directly with the organizational justice constructs. Overlap and distinctive characteristics between the two sets of fairness concepts will be examined. Through this process, control, social support, and power will be discussed in relation to fairness at work. The main goal of this discussion is to clarify the concept of fairness at work. Methodological limitations and recommendations for future research on fairness at work will be discussed in Chapter 6.

4.3.1 Distributive justice and fair wage

Factor 6, which represents employees' assessment of management's concern about fair wages, is most relevant to the distributive justice concept. Although the fair wage factor pertains to distribution of resources, it does not directly correspond with equity theory (Adams, 1965), the conceptualization of distributive justice widely used in the organizational justice literature. Equity theory claims that employees compare their input-to-output ratio with that of comparable others and that if the ratio is similar, the

output is considered fair. Comparative others are typically other workers with similar education, experience, and seniority (Greenberg, 1990). In this study, the two indicators of the fair wage factor both referred to management rather than other employees: "Is management concerned about paying employees what they deserve?" and "If the company earned more profit, would management consider increasing employee salaries?" These questions do not include comparisons between the employee himself and similar others. Rather, answering these questions implies an internalized standard against which employees assess fairness about their wages.

Internalized standards, or a sense of deserving, are likely to be developed through various comparisons over time. Equity theory specifies the pay comparison between equally qualified employees often in the same company or even in the same work unit (Greenberg, 1990), which is useful for organizational behavior researchers. In contrast, comparisons that determine internal standards can be made in broader contexts and with others who are not necessarily similar to themselves. Sennett and Cobb's important work, *The Hidden Injuries of Class* (1972), eloquently describes how people in working class measure their own value through eyes of those who are more privileged than themselves. Even a successful blue-collar worker, whom the authors interviewed, "feels illegitimate, a pushy intruder, in his entrance to the middle-class world […]. Despite the fact that he has gained entrée, he doesn't believe he deserves to be respected [as a middle-class person]" (p. 20). This third-generation Italian-American in Boston is uneasy about his middle-class status (e.g., a suburban home, college education for his son), suggesting that his current material status exceeds his internal standard of what he deserves. The sense of

deserving reflects the way the person has been treated in the society all his or her life, and is not derived from social comparisons with coworkers in the same company.

Comparison to an internalized norm is one of three comparisons that Vermunt and Steensma (2001) claimed as the basis for employees' perceptions of fairness. The other two are social comparison (i.e., comparison with others) and temporal comparison (i.e., comparison with what they received in the past). Discrepancy in any of these comparisons can lead to distress (Vermunt & Steensma, 2001). In the organizational justice literature, the emphasis has been on social comparison. As claimed in equity theory (Adams, 1965), it is commonly assumed that people assess the fairness of material distribution through comparisons with similar others. Martin (1986) argues that this assumption is misleading because it confuses what people expect and what people consider fair. Individuals in an economically disadvantaged group would expect their earnings to be smaller than members of an economically advantaged group. If the fairness of what they earn is assessed only through comparisons with other disadvantaged people, they should consider their earnings fair as long as all members of the disadvantaged group are equally disadvantaged. Martin (1986) claims that this assessment reflects whether or not their earnings meet the expectation within the group but not necessarily the fairness of the distribution of wealth. In an experiment with blue-collar workers, she distinguished an expected pay and perfectly fair pay (Martin, 1986). After watching a videotape describing a blue-collar worker in an occupation similar to themselves, the study participants provided different types of pay for the blue-collar worker in the video. The results demonstrated the distinction between what is expected

and what is fair: the study participants reported a significantly higher amount for the perfectly fair pay than the expected pay.

Martin's finding (1986) suggests that employees do not make fairness judgments based on comparisons with similar others. In the experiment, the blue-collar worker in the video was similar to the study participants. They therefore must have used their own pay as a reference point in reporting the expected and perfectly fair pay for the worker[5]. Most likely, their own pay would reflect the expected pay for the worker in the video because that is what they know a worker like themselves can actually receive. If the study participants made fairness assessments based on comparisons with similar others (i.e., between the participant himself and the worker in the video), the expected pay and the perfectly fair pay would have been the same. According to equity theory, if similar workers receive the same pay, it is a fair pay. However, the result was that the perfectly fair pay was higher than the expected pay. This suggests that the study participants used some other criteria to determine the fair pay for the worker like themselves. The criteria may include the profit the company makes, or some amount that the employee feels he deserves, as reflected in the indicators for the fair wage factor in this study.

Comparisons with similar others may still be important in employees' perceptions of fairness at work, but this dissertation study did not use equity theory and thus cannot discuss its importance. However, the fair wage factor suggests that pay fairness can be expressed without comparisons with similar others as equity theory claims, and thus equity theory may not entirely capture the fairness about pay.

[5] Since the study does not report the participants' pay, relationships between the amount they reported for the worker in the video and the amount of their own pay cannot be examined.

4.3.2 Procedural justice/voice and receptivity

The factor most closely related to procedural justice is Factor 3. This factor is characterized by the supervisor or management's taking employees' viewpoint into account by attending to their complaints and listening to suggestions. In other words, this factor represents employees' sense of the supervisor/management's openness to their voice at work. Voice is an important concept in procedural justice (Lind & Tyler, 1988; Thibaut & Walker, 1975). One explanation of the importance of voice in procedural justice is provided by the self-interest model (Lind & Tyler, 1988), which sees voice as a means to obtain desired outcome. For example, voice can be a complaint about the high temperature in the warehouse in summer. The employees' voice results in a favorable outcome if management responds to the complaint and installs fans. As a result, the employees' perception of management fairness would improve, according to the self-interest model.

This example of the self-interest model can be also described as employees' exerting control over their work condition. Based on the self-interest model, a positive relationship between job control and receptivity can be expected. In fact, in their seminal work, Thaibaut and Walker (1975) used *process control* to refer to procedural justice. As shown above, job control was indeed positively correlated with receptivity, but the magnitude was moderate ($r = .312$). This finding suggests that receptivity, or the supervisor/management's openness to employees' voice, does not entirely correspond with employees' control at work.

The job control measure used in this study taps the extent to which employees feel control over how they do their job tasks (i.e., pace, order, and amount of tasks, Hurrell &

McLaney, 1988). Theorell (2002) labeled this type of control "control *at work*", as opposed to "control *over work*". Control over work refers to employees' power over the whole working process and is related to democracy in the workplace (Theorell, 2002). Democracy is defined, at its simplest form, as a political system designed to allow every member in the group to have a voice (Marshall, 1998). To take control over work, employees must have a voice, and supervisors/management must be receptive to employees' voice. Since control *at* work is subsumed by control *over* work, the positive relationship between receptivity and control over work may have been stronger than the moderate correlation between receptivity and control at work.

Lind and Tyler (1988) proposed an alternative explanation for voice as a basis of procedural justice. The group-value model claims that voice symbolizes the group's authority treating group members "in ways that affirm their self-esteem by indicating that they are valued members of the group who deserve treatment with respect, dignity, and politeness" (Tyler, 1989 p. 837). According to Lind and Tyler (1988), allowing every member in a group (i.e., work unit, company) to voice his or her opinions promotes group solidarity and enhances relationships among the group members. This occurs regardless of each member receiving desired outcomes as a result of having a voice. Therefore, according to Lind and Tyler's two models (1988), voice has two functions in the workplace: one is to exert control over work, the other is to develop positive relationships between employees and the supervisor/management. This second function may not be correlated with control at work and thus may be additional explanation for the moderate correlation between control at work and receptivity.

4.3.3 Fairness and social support

The group-value model of procedural justice describes the relationship between the supervisor and subordinate as quite similar to interactional justice proposed by Bies and Moag (1986). This overlap has resulted in many organizational justice researchers to consider interactional justice as part of procedural justice (e.g., Greenberg, 1993a). Criteria for fair interpersonal treatment include honesty, politeness, and respect (Bies, 2001; Bies & Moag, 1986). These are also characteristics of social support provided from the supervisor. Social support is defined as interpersonal transactions intended to be helpful and involving emotional concern, respect, affirmation, and tangible aids (Heaney & Israel, 1997; House, 1981; House & Kahn, 1985). Regardless of the supervisor's supportive behavior being categorized as procedural justice, interactional justice, or social support, what is consistent is that supportive behavior stems from respect for the other individual. Well before procedural and interactional justice gained importance in the 1980s, Likert (1961) pointed out that supportive relationships between supervisors and subordinates relied on supervisors' ability to enhance subordinates' sense of personal worth and importance. This study empirically confirmed that social support from the supervisor is perceived as part of the supervisor's fairness. The data showed that social support measured by the well-established scale (Hurrell & McLaney, 1988) was better integrated with other fairness factors, rather than considered as a correlated but separate factor.

Three factors identified in this study (i.e., Factors 2, 4, and 5) are relevant to social support. Factor 2 was indicated by items regarding the supervisor/management's expressing their appreciation and recognition of good work. Expressed positive

evaluation enhances the person's sense of self-worth and encourages high-quality performance in the future (C. R. Rogers, 1965). As a formal organizational procedure, performance appraisal serves a similar purpose: communicating evaluation of the employee's work and encouraging better performance. In fact, fairness of performance appraisals has been one of the most popular topics in the organizational justice literature (Greenberg & Baron, 2000). However, formal performance appraisal is fundamentally different from showing appreciation for good work on a day-to-day basis. Whereas formal performance appraisal focuses on accurate evaluation, informally showing appreciation is an expression of positive regard. The former can be expressed in unsupportive ways, but the latter is always positive.

Factor 4 corresponds most closely to social support exchanged in personal relationships in broader contexts such as among family members and friends. Factor 4 represents the supervisor/management's willingness to accommodate employees' personal needs (i.e., "… help when an employee need a special favor", "…personal problems"). A willingness to help with employees' personal problems indicates that the supervisor/management treat employees as unique individuals rather than a mere source of labor. Respecting others as unique individuals with specific needs and concerns is a basis of personal relationships, in which support can be exchanged. Leadership studies within the organizational behavior literature have identified demonstrating individualized concerns and respect for subordinates as important characteristics of effective leaders (Jung & Avolio, 2000). However, these characteristics have not been examined in relation to organizational justice.

Factor 5 is also relevant to social support. This factor was indicated by the supervisor/management's concern about employees' work-related well-being. It reflects role expectations for the supervisor/management more clearly than the support factor discussed above. Emergence of this factor in fairness at work suggests that employees expect "noblesse oblige": because the supervisor/management has the authority to set workplace policies, they also have obligations to ensure employee well-being. An effective way of enhancing employee well-being has been suggested in occupational stress research: increasing employees' control over work (Karasek & Theorell, 1990; Schnall, Landsbergis, & Baker, 1994; Paul E. Spector, 1986; Theorell, 2002). As discussed above, control and voice are closely related concepts. The supervisor and management must listen to employees' voice in creating policies and rules. This will be perceived as fair by employees, increase employees' control over work, and enhance employee well-being.

Ensuring employee well-being, however, does not receive much attention in the leadership literature. The organizational behavior research in general focuses on employee well-being (often measured as job satisfaction) as an antecedent for effective organizational functioning (e.g., high productivity, low turnover). It has been found that employee well-being is an important mediator for effective organizational functioning (e.g., Patterson, Warr, & West, 2004). Therefore, organizational behavior research and practice have rationale for taking employee well-being in their agendas.

These three factors clearly suggest that receiving support from the supervisor/management is perceived as part of fairness at work. Nevertheless, social support has not been explicitly studied in the organizational justice literature. The group-

value model of procedural justice (Lind & Tyler, 1988) and interaction justice (Bies & Moag, 1986) did introduce the importance of respect for employees, but research on these topics has been limited in formal organizational contexts (i.e., performance appraisal, downsizing) and has not addressed the quality of day-to-day social interactions at work.

Perhaps social support is not on the research agenda in organizational behavior because supervisors do not think it is important. Greenberg (1988) asked over 800 supervisors how important it is to be fair to their subordinates, how important it is to *look* fair to their subordinates, and what they do to appear to be fair. The last question was an open-ended question. The results showed that the supervisors considered looking fair and being fair independent ($r = .06$) and that they were more concerned about looking fair than actually being fair (mean scores were 7.9 and 6.1, respectively, on a 9-point scale). In order to appear to be fair, the supervisors reported behaviors that were categorized as the following: announcing all pay raises and promotions (82%), explaining how pay raises are determined (76%), allowing subordinates' participation in decision making (55%), and explaining why work assignments are made (43%). All of these are positive behaviors, as opposed to disguising unfair acts. However, the list does not include providing social support, except for providing information. This suggests that the supervisors do not realize that daily informal interactions with their subordinates have an impact on the assessment of supervisor fairness. If looking fair is important to supervisors, and if it benefits work organizations, supervisors and management personnel should learn effective ways of providing social support to subordinates. If they successfully provide social support, their intention to look fair may coincide with actually being fair.

4.3.4 Fairness and power

Factor 1 was indicated by the supervisor/management's taking advantage of employees, not treating them with respect, blaming them for things outside of their control, playing favorites among employees, and making unreasonable demands. Among the traditional organizational justice constructs, this factor somewhat resembles, but does not entirely correspond with, interactional (in)justice. As listed in Table 2.1 (p. 26), behaviors indicating interactional justice/injustice include treating employees with respect (Bies, 2001; Bies & Moag, 1986) and making wrongful accusations (Bies, 2001). In a phenomenological study of unfairness, Mikula (1986) found similar behaviors experienced by his students as unfair: misuse of higher status, orders given in an inappropriate tone, unjustified accusations and blame, and unconscionable demands. Although Mikula's respondents were instructed to report unfair events in any context, most reported events involved power figures such as teachers, parents, police officers, and supervisors at work. In a similar study conducted in Sweden, Biel and colleagues (1997) also found an authority's misuse of power as the common theme among reported unjust events. These events were either an officially appointed authority mistreating the public or an employer behaving unfairly to an employee. Miller (2001) pointed out that disrespectful action by a higher-status person was considered an abuse of power. These findings suggest that mistreatment implies a power differential between the wrongdoer and victim.

Mikula and colleagues' exploration of the everyday experience of fairness (Mikula, 1986; Mikula, Petri, & Tanzer, 1990) found power as an axis on which unfair experiences could be mapped. They first asked their student participants to report their

experience of unfair events and then used the Q-sorting technique, cluster analysis, and multidimensional scaling analysis to determine the dimensional structure of unjust events. Focusing on the perpetrator-victim relationship, they identified one dimension on which each unjust event could be mapped. One pole of the dimension is task-oriented relationships with unequal power (i.e., representing work and other formal settings), and the other pole is socio-emotional relationships with equal power (i.e., representing family and peer interactions). Unfair events mapped near the first pole were characterized as distribution of goods and benefits, arbitrariness of authority figures, and unfriendly or aggressive treatment. Interestingly these characteristics correspond with three organizational justice concepts: distributive, procedural, and interactional justice.

Power, broadly defined as the capacity to change the behavior or attitudes of others in a desired manner (Raven, 1992), is an important concept for understanding fairness (R. L. Cohen, 1986a; Cook & Hegtvedt, 1986). Yet, as pointed out by Cook and Hegtvedt (1986), there exists "a curious omission of the topic of power in much of the research on equity and distributive justice" (p. 19). It appears also true for procedural and interactional justice research. This lack of attention to power was mentioned by other influential organizational justice scholars (e.g., Greenberg & Cohen, 1982a) during the 1980s, but researchers did not pay attention to power until very recently. Perhaps it was because power is so fundamental to the structure of work organizations that researchers did not study it, in the same way fish do not see water. The recent attention to power in organizational justice research was prompted by economic globalization (Greenberg, 2001b). As an increasing number of businesses operate in multi-national and cultural contexts, organizations' effective functioning depends on successful applications

of organizational theories and practices to other cultures, even though these theories and practices have been developed solely in the western culture.

One key concept organizational justice researchers found in examining justice perceptions in non-western cultures is *power distance*. Power distance refers to "the extent to which less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede, 1991, p. 28). High power distance societies are hierarchical and legitimize a power differential across the hierarchy while low power distance societies are more egalitarian and resist power differential among members of the society. Several studies have found that power distance moderates the relationship between organizational justice perceptions and employees' attitudes such as job satisfaction (Begley, Lee, Fang, & Li, 2002; Brockner et al., 2000; Lam, Schaubroeck, & Aryee, 2002), intention to quit (Begley et al., 2002), job performance (Lam et al., 2002), absenteeism (Lam et al., 2002), commitment to the company (Begley et al., 2002; Brockner et al., 2000), and organizational citizenship behavior (Begley et al., 2002). A consistent finding is that fairness influences employees' attitudes toward the job and company to a greater extent in low power distance countries (e.g., US, Germany) than in high power distance countries (e.g., China, Mexico)[6]. Brockner and his colleagues (2000) recommend that in order to prevent subordinates' unfavorable reactions to management policies, management should consider how much voice is expected by the subordinates' national culture and allow them just enough voice to meet the national norm.

[6] One might be tempted to make a sarcastic inference from these findings: unfair treatment in China and Mexico would not hurt employees as much as in the US and thus multinational corporations may be able to pursue their interests with less consideration for fair employment practice in these countries.

While cross-cultural investigations of power may seem useful for the top management of multinational corporations, power differential within each workplace—in whichever country the workplace is located—may have important implications for employee well-being. In their study with federal court employees, Cortina and Magley (2003) examined the influence of power differential on the consequences of resisting interpersonal mistreatment (i.e., disrespect, rudeness, condescension, and sexual harassment). When the victim reacts to mistreatment by confronting the wrongdoer by seeking allies among coworkers or reporting to authorities, she or he often experiences retaliation, a further injustice. Cortina and Magley (2003) found that the more power the wrongdoer had relative to the victim, the more likely the victim's resistance triggered retaliation. This result suggests that the greater the power differential between the wrongdoer and victim, the less likely the victim is to fight back due to fear of retaliation. The same study found that among the victims of mistreatment, those who fought back without experiencing retaliation reported better psychological and physical well-being than those who fought back and received retaliation. The victims who did not fight back had the worst psychological and physical well-being.

Cortina and Magley (2003) demonstrated that power differentials in unfair treatment have a significant impact on the victims' reaction to unfairness. Unfair treatment addressed in the study includes disrespect, rudeness, condescension, and sexual harassment, which the respondents encountered in their everyday work lives, as opposed to discrimination in formal organizational procedures (e.g., gender discrimination in pay raise). Therefore, the wrongdoer is not necessarily of higher rank than the victim; the person can be a peer or subordinate. When the wrongdoer has power over the victim,

Cortina and Magley's findings suggest that the consequence of mistreatment is more detrimental because the victim is discouraged from fighting back, and if the victim does fight back, he or she is likely to be subjected to additional unfair treatment in the form of retaliation.

It is not clear at this point whether the existence of power differential is itself unfair, power differentials facilitate unfair treatment, or power differentials are a separate factor that exacerbates the consequences of unfairness. A possibility that power differentials facilitate unfair treatment has been proposed in the context of sexual harassment (e.g., Cleveland & Kerst, 1993), but research findings are not conclusive (Rospenda & Richman, 2005). Evidence for the last possibility was presented by Cortina and Magley (2003). Because their main focus in their study was retaliation after resistance to initial mistreatment, the relationship between initial mistreatment and power differential was not addressed and thus the first and second possibilities have not been discussed. Max Weber, who regarded power as the fundamental concept in social stratification, defined power as "the probability of persons or groups carrying out their will *even when opposed by others*" (Marshall, 1998, p. 519, emphasis added). According to Weber, power enables individuals to get what they want at the expense of others. This view of power can be easily interpreted as assuming that the existence of a power differential in and of itself is unfair. While Weber's definition of power implies conflicts, power can be used positively in social interactions (e.g., van Ryn & Heaney, 1997). The concept of power distance suggests that some societies see unequal power distribution as more normative and even desirable than others. In such societies, power may be used in

positive ways. The concepts of power and fairness need further examination through interdisciplinary collaboration.

4.3.5 Summary: Underlying structure of fairness at work

While fairness is treated as a subjective construct or perception in the organizational justice literature, surprisingly few studies investigated employees' own accounts. Over twenty years ago, Deutsche (1983) expressed dismay over "no research relating to the phenomenology of injustice […] or to those who suffer injustice" (p. 312). This is still true today, with only a few exceptions (e.g., Mikula, 1986; Mikula et al., 1990). Perhaps fairness is assumed to be such a fundamental value in social life that the need for examining the experience of fairness has not been recognized. Who has not said, felt, or heard the claim, "it's unfair!"? Hence, it is assumed that everyone knows what fairness is. However, the congruence between common understanding of fairness and theoretically defined organizational justice concepts needs to be confirmed. In his forward to *Equity and Justice in Social Behavior* (Greenberg & Cohen, 1982b), Homans complained about various terms used in organizational justice research: "In their general sense they do not [refer to different things]. The special senses [assigned by researchers] are the ones that make trouble" (p. xi). This statement can be elaborated as follows: special senses conventionally assigned without careful examination are the ones that make trouble in subsequent investigations.

The most important point in the analysis presented in this chapter is that an underlying structure of employees' fairness perceptions was explored using an inductive approach. The resulting six aspects of fairness are related to but do not entirely

correspond to traditional organizational justice concepts. The data showed that although the six factors are highly correlated, they were better considered as separate. Compared to the traditional organizational justice concepts, this study provided much finer conceptualization of fairness at work, which may be useful in developing intervention strategies to promote fairness at work. These six aspects are the building blocks of perceived fairness at work. The high correlations make it impossible to examine the independent effects they may have on employee outcomes. This is discussed in the next chapter.

Another key finding is that fairness at work and social support are deeply intertwined. This finding suggests that the research on fairness and health can be informed by the well-established literature of social support. Since social support research has been focused on outcomes related to health and well-being, future investigations on fairness and employee health will greatly benefit from the wealth of knowledge accumulated in the social support literature.

CHAPTER 5

RELATIONSHIPS BETWEEN FAIRNESS AT WORK AND EMPLOYEE WELL-BEING

In this chapter, the relationships between fairness and employee well-being are examined while job stressors, job control, and social support from coworkers were controlled for. First, factor score estimates were calculated and multicollinearity was checked. Then linear regression analysis was conducted using AMOS to examine the unique contribution of fairness to explaining variances in job satisfaction, global job strain, and psychological well-being. Following regression model building procedures, a series of models were fit to the data: first job stressors, job control, and social support variables were entered to the model, and then the fairness variables were added one at a time. If any of the job stressor and fairness variables had significant regression coefficients, the interactions between these variables were examined by adding the product of the two variables as an interaction term. This approach was taken for two reasons. First, there has not been sufficient research so that specific hypotheses on moderating effects can be determined *a priori*. Thus some empirical guidelines were needed. Second, although main effects of both a stressor and moderator on strain can be masked by cross-over interaction, in this study it seems unlikely to occur. A cross-over interaction between a job stressor and fairness on strain would indicate that when stressor is high, low fairness is associated with higher strain than high fairness; and that when

stressor is low, *high* fairness is associated with higher strain than low fairness. Since higher levels of fairness are assumed to be more beneficial than lower levels of fairness regardless of the level of stressors, the cross-over interaction is unlikely. Thus, there is unlikely to be a significant interaction if there are not main effects of both stressors and fairness.

The mediating effect of fairness was also examined if adding the fairness variables reduced the relationship between stressor variables and strain. Barron and Kenny's procedure (1986) was used to test mediating effects (details are described below).

In all models, all independent variables were allowed to correlate with each other, which made this analysis equivalent to multiple linear regression analysis. Naturally, no model fit indices were used. Rather than examining overall model fit, this study aimed to identify the relative importance of fairness variables in association with employee well-being over and above other traditional job stress variables. An increase in the squared multiple correlation of the dependent variable by adding the fairness variables is an important indicator for this purpose.

5.1 Factor Score Estimates and Multicollinearity

For each of the supervisor and upper management fairness factors, factor score estimates were calculated as a weighted sum of all items in the CFA model. The factor score weights were obtained from AMOS. As presented in Tables 4.6 and 4.11 in the previous chapter, fairness factors are highly correlated with each other. This high

correlation can create multicollinearity problems. The second column of Table 5.1 shows tolerance (i.e., the portion of the variance that is not explained by other variables) for each of the fairness factors. Except for Factor 6 of management fairness, which represents management's concern about paying fair wages, all variables had very small tolerances. Therefore, all five factor score variables for supervisor fairness were added together to compose one supervisor fairness variable. Factors 1 through 5 for management fairness were also combined into one management fairness variable. Before combining, the scores for Factor 1 were reversed so that all variables had the same conceptual direction. In the combined variables, higher scores indicate fairer behaviors of the supervisor or management. Factor 6 representing management's concern about fair wage was kept separate. Tolerance for these new combined variables is shown in the third column of Table 5.1.

Factor score variable	Tolerance	Tolerance (after combining variables)
Supervisor Factor 1	0.008	
Supervisor Factor 2	0.012	
Supervisor Factor 3	0.013	0.601
Supervisor Factor 4	0.009	
Supervisor Factor 5	0.004	
Management Factor 1	0.061	
Management Factor 2	0.083	
Management Factor 3	0.037	0.407
Management Factor 4	0.048	
Management Factor 5	0.046	
Management Factor 6	0.219	0.578

Table 5.1: Tolerance for the fairness factors.

Factor score estimates were also calculated for all other constructs, except for global job strain and psychological well-being. Because these two constructs were

measured with dichotomous responses, CFA was not appropriate. Instead of calculating factor scores, scores for these variables were the sum of the items. Since the 12 items in global job strain was coded as 3, 1.5 or 0 (Stanton et al., 2001), individual scores ranged from 0 to 36. Higher scores indicate more strain. As for psychological well-being, the 12 items were coded 1 or 0 (Goodchild & Duncan-Jones, 1985). Individual scores ranged from 0 to 12, with higher scores indicating better psychological states.

All independent variables (i.e., stressors, social support from coworkers, job control, supervisor fairness, and management fairness) were checked for multicollinearity. As shown in the second column of Table 5.2, two stressor variables, role ambiguity and vigilance, had very small tolerance, which indicated virtually all variances were explained by other variables[7]. These two variables were combined to form a new variable. Since the correlation coefficient between the two variables was -.94, first the sign of role ambiguity scores was reversed to indicate *role clarity*, and then vigilance was added it. Higher scores on this new variable represent the respondent's clear understanding of role expectations and higher alertness on the job. After combining these two variables, each variable had a reasonable level of tolerance as shown in the third column of Table 5.2.

Factor score variable	Tolerance	Tolerance (after combining variables)
Workload	0.332	0.458
Role conflict	0.055	0.357
Role ambiguity	0.002	0.169

[7] This may be due to specific characteristics of the participants' jobs in furniture distribution centers. Vigilance, or being alert on the job, may be seen as a role expectation for them as warehouse men. Their main job activity is moving heavy pieces of furniture not only on the ground level but also 20 feet above ground on the furniture rack. Absent-mindedness can easily result in injuries to themselves or coworkers.

Vigilance	0.004	
Divided attention	0.020	0.209
Social support from coworkers	0.904	0.924
Job control	0.686	0.688
Supervisor fairness	0.524	0.529
Management fairness	0.380	0.385
Fair wage	0.561	0.561

Table 5.2: Tolerance for all independent variables

		n	mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	Workload	328	0.001	0.627	(.75)											
2	Role conflict	328	0.006	0.619	0.559	(.84)										
3	Role clarity/vigilance	328	0.008	1.075	0.338	-0.143	(.76)									
4	Divided attention	328	0.007	0.557	0.419	0.184	0.830	(.63)								
5	Social support (coworkers)	342	0.007	0.709	*0.003*	-0.171	0.173	*0.076*	(.78)							
6	Job control	336	0.011	0.679	*0.020*	-0.145	0.494	0.446	*0.092*	(.74)						
7	Supervisor fairness	329	0.071	3.778	-0.232	-0.458	0.243	*0.096*	0.174	0.266	(.95)					
8	Management fairness	303	-0.059	3.536	-0.238	-0.417	0.196	*0.055*	0.202	0.312	0.631	(.95)				
9	Fair wage	303	0.007	0.769	-0.245	-0.330	*0.037*	*-0.044*	0.119	0.198	0.378	0.646	(.78)			
10	Job Satisfaction	340	0.001	0.621	-0.260	-0.413	0.197	*0.062*	0.197	0.263	0.472	0.554	0.460	(.80)		
11	Global job strain	341	17.270	11.586	0.475	0.518	*-0.039*	0.139	-0.208	-0.223	-0.469	-0.491	-0.441	-0.591	(.90)	
12	Psychological well-being	337	8.448	2.697	-0.214	-0.438	0.185	*0.043*	0.210	0.172	0.343	0.424	0.295	0.464	-0.451	(.80)

Note: Numbers in parentheses on diagonal indicate Cronbach alpha. Missing cases were omitted pairwise in this table. Italicized correlation coefficients are not statistically significant ($p > .05$).

Table 5.3: Descriptive statistics and correlation matrix for all variables.

Table 5.3 presents descriptive statistics and a correlation matrix for all variables used in the analysis. The mean score for all variables except for global job strain and psychological well-being is virtually zero because all but these two variables are factor score estimates. The three outcome variables—job satisfaction, global job strain, and psychological well-being—have significant correlation coefficients with most of the independent variables. One of the job stressor variables, divided attention, had few significant correlation coefficients with other variables.

5.2 Job Satisfaction

5.2.1 Main effect of fairness

Table 5.4 presents the regression results of two main effect models with job satisfaction as the dependent variable. In Model 1, where four job stressor variables were included, workload and role conflict had significant regression coefficients. After job control and social support from coworkers were included in the model (Model 2), the two stressors were still significant. As shown in Table 5.5, when fairness variables were added to the model (Models 3-1, 3-2, 3-3), each of the three fairness variables had a significant regression weight. Management fairness explained the largest amount of variance (13.1%) among the three fairness variables. When three fairness variables were added to the model at once (Model 4 shown in Table 5.6), they together explained 14.7% of variance in job satisfaction.

	Model 1				Model 2			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Workload	-0.169	0.070	-0.171	0.016	-0.148	0.070	-0.150	0.033
Role conflict	-0.298	0.078	-0.297	<.001	-0.275	0.077	-0.274	<.001
Role clarity & Vigilance	0.105	0.067	0.181	0.116	0.058	0.067	0.101	0.384
Divided attention	0.034	0.121	0.030	0.780	0.003	0.120	0.003	0.978
Social support (coworkers)					0.100	0.044	0.114	0.022
Job control					0.138	0.053	0.151	0.009
adj. R2			0.204				0.231	
Change in adj. R2			--				0.027	

Dependent variable: Job satisfaction

Table 5.4: Main effect model including job stressors, social support from coworkers, and job control with job satisfaction as the dependent variable

	Model3-1				Model 3-2				Model 3-3			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Workload	-.129	.067	-.130	.054	-.110	.064	-.111	.087	-.125	.066	-.126	.058
Role conflict	-.153	.077	-.153	.047	-.143	.073	-.142	.050	-.176	.074	-.176	.017
Role clarity & Vigilance	.046	.064	.079	.474	.042	.061	.074	.489	.085	.063	.147	.179
Divided attention	-.014	.115	-.013	.901	.011	.110	.010	.918	-.016	.113	-.014	.888
Social support (coworkers)	.077	.042	.088	.064	.060	.040	.069	.137	.080	.041	.91	.052
Job control	.103	.051	.113	.043	.049	.050	.053	.326	.079	.050	.087	.117
Supervisor fairness	.050	.009	.304	<.001								
Management fairness					.074	.009	.423	<.001				
Wage fairness									.272	.041	.338	<.001
adj. R2			.297				.362				.326	
Change in adj. R2 from Model 2			.066				.131				.095	

Dependent variable: Job satisfaction

Table 5.5: Regression results including stressor variables, social support from coworkers, job control, and fairness variables

	Model 4			
Variable	Reg. Weight	S.E.	Std. Reg weight	P
Workload	-0.107	0.063	-0.108	0.090
Role conflict	-0.095	0.073	-0.095	0.193
Role clarity & Vigilance	0.059	0.060	0.103	0.328
Divided attention	-0.013	0.108	-0.012	0.902
Social support (coworkers)	0.054	0.040	0.062	0.171
Job control	0.041	0.049	0.045	0.403
Supervisor fairness	0.021	0.010	0.130	0.030
Management fairness	0.044	0.013	0.252	<.001
Fair wages	0.137	0.049	0.171	0.005
adj. R2			0.378	
Change in adj. R2 from Model 2			0.147	

Dependent variable: Job satisfaction

Table 5.6: Main effect model including stressors, social support, job control, and three fairness variables with job satisfaction as the dependent variable

5.2.2 Moderating effect of fairness

The regression weight for workload was marginally significant in Models 3-1, 3-2, and 3-3 (Table 5.5). However, the interactions between workload and each of the fairness variables were not significant (b = -.006, p = .641 for workload*supervisor fairness; b = .011, p = .386 for workload*management fairness; and b = .057, p = .374 for workload*wage fairness).

5.2.3 Mediating effect of fairness

The regression weight for role conflict remained significant in Models 3-1, 3-2, and 3-3 (Table 5.5); but the magnitude of the coefficient decreased by more than 1 standard error compared to Model 2 (Table 5.4). The magnitude of the unstandardized

regression weight for workload also decreased, although to a lesser degree compared to role conflict, when fairness variables were included in the model (see Tables 5.4 and 5.5). This led to a consideration of a possible mediation role of the fairness variables between role conflict and job satisfaction, as well as between workload and job satisfaction. Baron and Kenny (1986) explained the process of testing the mediator effect in three steps: Step 1) significant relationships between the dependent variable, Y, and both the independent, X, and mediator variables, Z; Step 2) a significant relationship X and Z, and Step 3decrease in the magnitude of relationship between X and Y when Z is included in the model.

In the current analysis, Step 3 is already met since the magnitude of the regression coefficients for role conflict and workload decreased between Model 2 and Models 3-1 to 3-3. Step 1 is met because both role conflict and workload had a significant regression weight in Model 2. As for the fairness variables, regression weights were significant when role conflict were excluded from Model 3 (see Table 5.7 top panel). Step 2, the relationships between role conflict, and the three fairness variables are shown in Table 5.7 bottom panel. Role conflict and workload have a significant regression weight on all fairness variables. From these analyses, it is concluded that the relationships of both role conflict and workload to job satisfaction are mediated by all three fairness variables.

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	Dependent Variable: Job Satisfaction			
Variable	Reg. Weight	S.E.	Std. Reg weight	P
Supervisor fairness	0.028	0.010	0.173	0.003
Management fairness	0.047	0.013	0.266	<.001
Fair wages	0.154	0.049	0.191	0.002

	Dependent Variable: Supervisor fairness				Dependent Variable: Management fairness				Dependent Variable: Fair wages			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Role conflict	-2.421	0.463	-0.397	<.001	-1.753	0.456	-0.307	<.001	-0.356	0.106	-0.287	<.001
Workload	-1.403	0.331	-0.233	<.001	-1.353	0.322	-0.240	<.001	-.299	0.070	-0.244	<.001

Note: Other stressors, job control, and social support from coworkers are controlled for in each analysis.

Table 5.7: Regression weights of fairness variables on job satisfaction (top table) and regression weights of role conflict and workload on fairness variables (bottom table) calculated for testing the mediation effect by fairness variables.

The mediating effect of fairness between role conflict and job satisfaction was further examined in order to explore how different types of role conflict were associated with fairness and job satisfaction. The role conflict scale used in this study had seven items, each of which described various types of role conflict (wording shown in Table 5.8). Instead of the aggregated role conflict variable, each of the role conflict items was tested in regression models. Among the seven, four items (Items 1, 2, 3, and 6) had a significant regression weight on job satisfaction after controlling for other stressors, social support from coworkers, and job control (Table 5.8). In addition, Item 5, "how often there is too little time to get things done?", had a marginally significant regression weight on job satisfaction ($p = .087$). For these items, the mediating effect of the fairness variables was tested using Baron and Kenny's procedure (1986). Table 5.9 shows regression weights for seven role conflict items on each of the fairness variables. The five items that were significantly associated to job satisfaction had significant regression weights on the three fairness variables (Table 5.9), except for the item, "how often there is too little time to get things done?" on fairness regarding wages. When the fairness variables were added to the model with job satisfaction as the dependent variable, the regression weights for Items 1, 2, 5, and 6 were no longer significant (Table 5.8). Therefore, the relationships between each of these role conflict items and job satisfaction were fully mediated by the fairness variables. For Item 3, the regression weight remained significant, but its magnitude was reduced the by about 2 standard errors (from $b = -.146$, $SE = .035$, $p<.001$ to $b = -.084$, $SE = .033$, $p =.010$). The relationship between Item 3 and job satisfaction was partially mediated by the fairness variables.

	Model without fairness variables				Model with fairness variable				
Role conflict item	Reg. Weight	S.E.	Std. Reg weight	p	Reg. Weight	S.E.	Std. Reg weight	p	Mediation by fairness
1. Do things that are apt to be accepted by one person and not accepted by others	-.116	.037	-.195	.001	-.031	.034	-.051	.367	Yes
2. Do things on the job that are against your better judgment	-.102	.033	-.176	.002	-.035	.031	-.061	.254	Yes
3. Feel pressure to do things that you think may not be best	-.156	.035	-.249	<.001	-.084	.033	-.135	.010	Partially
4. Receive conflicting requests from two or more people	-.046	.033	-.080	.164	--	--	--	--	No
5. Your job leaves you with little time to get things done (originally a workload item)	-.054	.031	-.098	.087	-.021	.028	-.038	.465	Yes
6. Have to bend or break a rule or policy to carry out an assignment	-.107	.032	-.175	<.001	-.033	.030	-.053	.278	Yes
7. Too many different things to do at work (Cross loading on Workload)	-.016	.033	-.028	.627	--	--	--	--	No

Notes: . Other stressors (i.e., workload, role clarity/vigilance, divided attention), social support from coworkers, and job control were controlled for.

Table 5.8: Regression weights for role conflict items on job satisfaction with and without fairness variables

Role conflict item	Dependent variable: Supervisor fairness				Dependent variable: Management fairness				Dependent variable: Fair wages			
	Reg. Weight	S.E.	Std. Reg weight	p	Reg. Weight	S.E.	Std. Reg weight	p	Reg. Weight	S.E.	Std. Reg weight	p
1. Do things that are apt to be accepted by one person and not accepted by others	-.898	.223	-.247	<.001	-.881	.215	-.260	<.001	-.163	.050	-.221	.001
2. Do things on the job that are against your better judgment	-.907	.202	-.256	<.001	-.693	.198	-.210	<.001	-.114	.046	-.158	.014
3. Feel pressure to do things that you think may not be best	-.936	.215	-.246	<.001	-.819	.209	-.230	<.001	-.126	.049	-.162	.010
4. Receive conflicting requests from two or more people	-.776	.199	-.221	<.001	-.719	.193	-.219	<.001	-.170	.044	.238	<.001
5. Your job leaves you with little time to get things done (originally a workload item)	-.538	.191	-.162	.005	-.194	.187	-.062	.300	-.085	.043	-.126	.047
6. Have to bend or break a rule or policy to carry out an assignment	-.890	.195	-.234	<.001	-.749	.189	-.215	<.001	-.148	.044	-.195	<.001
7. Too many different things to do at work (Cross loading on Workload)	-.271	.205	-.049	.403	-.172	.199	-.052	.386	-.058	.046	-.070	.270

Note: Other stressors (i.e., workload, role clarity/vigilance, divided attention), social support from coworkers, and job control were controlled for.

Table 5.9: Regression weights for role conflict items on each of the fairness variables.

5.3 Global Job Strain

5.3.1 Main effect of fairness

Table 5.10 presents the regression results for two main effect models with Global job strain as the dependent variable. In Model 1, where four job stressor variables were included, all but divided attention had a significant regression weight. The regression weight for divided attention was marginally significant ($p = .083$). After job control and social support from coworkers were included in the model (Model 2), role clarity and vigilance no longer had a significant regression weight, but the regression weights for other stressor variables remained significant. As shown in table 5.11, when the fairness variables were added to the model one at a time (Models 3-1, 3-2, 3-3), each of the three fairness variables had a significant regression weight. Management fairness explained the largest amount of variance in global job strain (7.0%) among the three fairness variables. When three fairness variables were added to the model at once (Model 4 shown in Table 5.12, all independent variables explained 47.5% of the variance in the global job strain variable, with three fairness variables together explaining 9.1%.

	Model 1				Model 2			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Workload	6.226	1.203	0.335	<.001	5.799	1.172	0.314	<.001
Role conflict	5.150	1.339	0.273	<.001	4.596	1.298	0.244	<.001
Role clarity & Vigilance	-2.481	1.145	-0.229	0.030	-1.314	1.127	-0.122	0.244
Divided attention	3.606	2.077	0.172	0.083	4.237	2.019	0.204	0.036
Social support (coworkers)					-2.395	0.741	-0.146	0.001
Job control					-3.287	0.893	-0.192	<.001
adj. R2			0.338				0.384	
Change in adj. R2			--				0.046	

Dependent variable: Global job strain

Table 5.10 Main effect model including job stressors, social support from coworkers, and job control with global job strain as the dependent variable

	Model3-1				Model 3-2				Model 3-3			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Workload	6.517	1.121	.304	<.001	5.561	1.113	.300	<.001	5.527	1.125	.299	<.001
Role conflict	2.287	1.303	.122	.079	2.589	1.275	.137	.042	3.150	1.279	.168	.014
Role clarity & Vigilance	-1.054	1.073	-.098	.328	-1.219	1.069	-.113	.254	-1.698	1.084	-.158	.117
Divided attention	4.534	1.933	.219	.019	4.358	1.915	.210	.023	4.474	1.938	.216	.021
Social support (coworkers)	-2.082	.711	-.127	.003	-1.921	.706	-.117	.007	-2.137	.711	-.130	.003
Job control	-2.715	.859	-.159	.002	-2.083	.868	-.122	.016	-2.443	.869	-.143	.005
Supervisor fairness	-.858	.151	-.280	<.001								
Management fairness					-.998	.163	-.304	<.001				
Wage fairness									-3.876	.713	.257	<.001
adj. R2			.437				.454				.438	
Change in adj. R2 from Model 2			.053				.070				.054	

Dependent variable: Global job strain

Table 5.11: Regression results including stressor variables, social support from coworkers, job control, and fairness variables

	Model 4			
Variable	Reg. Weight	S.E.	Std. Reg weight	P
Workload	5.424	1.087	0.294	<.001
Role conflict	1.522	1.275	0.081	0.233
Role clarity & Vigilance	-1.319	1.050	-0.123	0.209
Divided attention	4.600	1.874	0.222	0.014
Social support (coworkers)	-1.835	0.691	-0.112	0.008
Job control	-1.965	0.848	-0.115	0.020
Supervisor fairness	-0.527	0.172	-0.172	0.002
Management fairness	-0.427	0.223	-0.130	0.055
Fair wages	-2.159	0.854	-0.143	0.011
adj. R2			0.475	
Change in adj. R2 from Model 2			0.091	

Dependent variable: Global job strain

Table 5.12: Main effect model including stressors, social support, job control, and three fairness variables with global job strain as the dependent variable

5.3.2 Moderating effect of fairness

The regression weight for workload and divided attention remained significant in Models 3-1, 3-2, and 3-3 (Table 5.11). Interactions between these two stressor variables and each of the fairness variables were examined. The interaction between workload and wage fairness was significant (b = -108, p = .017 as shown in Model 5 in Table 5.13). Figure 5.1 illustrates the interaction effect. When Workload is low, employees' perceptions of fair wages do not affect the level of Global job strain; however, when Workload is high, lower fairness perceptions about wages are associated with higher Global job strain. In other words, if employees feel that management is concerned about paying fair wages, they are less likely to be adversely affected by high workload. Interactions between workload and other two fairness variables were not significant (b = -.010, p = .817 for workload*supervisor fairness; b = .058, p = .200 for workload*management fairness). None of the interactions between divided attention and each of the three fairness variables was significant (b = .004, p = .928 for divided attention*supervisor fairness; b = -.016, p = .709 for divided attention*management fairness; and b = -.005, p = .914 for divided attention*wage fairness).

	Model 5			
Variable	Reg. Weight	S.E.	Std. Reg weight	P
Workload	5.369	1.123	0.290	<.001
Role conflict	1.685	1.292	0.090	0.192
Role clarity & Vigilance	-1.237	1.074	-0.115	0.250
Divided attention	3.954	1.877	0.191	0.035
Social support (coworkers)	-1.505	0.704	-0.092	0.033
Job control	-1.363	0.887	-0.080	0.125
Supervisor fairness	-0.535	0.174	-0.174	0.002
Management fairness	-0.400	0.226	-0.122	0.077
Fair wages	-2.441	0.872	-0.162	0.005
Workload * Fair wages	-2.633	1.101	-0.135	0.017
adj. R2			0.492	
Change in adj. R2 from Model 3-3			0.012	

Dependent variable: Global job strain

Table 5.13: Regression results with global job strain as the dependent variable (Interaction model)

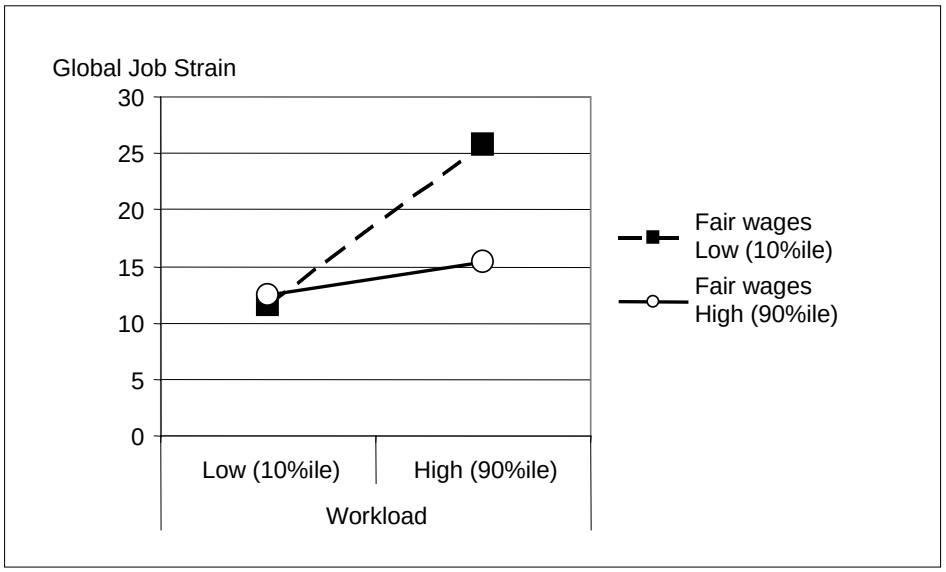


Figure 5.1: Interaction effect between workload and fair wages on global job strain.

5.3.3 Mediating effect of fairness

One of the stressor variables, role conflict, was significantly associated with global job strain (Model 2 in Table 5.10). When fairness variables were added in the model, the magnitude of the regression weight decreased by more than 1 standard error from Model 2 to Models 3-1, 3-2, and 3-3. From this result, a potential mediating effect of fairness variables was examined according to Baron and Kenny's three-step procedure (1986) as descried above. Step 1 criterion, a significant relationship between role conflict and global job strain was met, as shown in Model 2 in Table 5.10. Step 2 criterion, a significant relationship between fairness variables and global job strain, was also met (see Table 5.14). Role conflict was significantly associated with each of the fairness variables (see Table 5. 7 bottom panel). Finally, Step 3 criterion, a decrease in magnitude of the relationship between role conflict and global job strain, is shown in Models 3-1, 3-2, 3-3 in Table 5.11. Therefore, it was concluded that all three fairness variables mediate the relationship between role conflict and global job strain.

	Dependent Variable: Global job strain			
Variable	Reg. Weight	S.E.	Std. Reg weight	P
Supervisor fairness	-0.559	0.170	-0.182	0.001
Management fairness	-0.437	0.225	-0.133	0.052
Fair wages	-2.172	0.857	-0.144	0.011

Notes: Dependent variable was global job strain. Stressors other than role conflict, job control, and social support from coworkers are controlled for.

Table 5.14: Regression weights of fairness variables on global job strain.

The mediating effect of fairness between each of the seven role conflict items and global job strain was further examined in the same procedure described in Section 5.2.3. All seven items had a significant regression weight on global job strain after controlling for other stressors, social support from coworkers, and job control (Table 5.15). As shown in Table 5.9, Items 1, 2, 3, 4, and 6 had a significant regression weights on all fairness variables. Item 4 was not associated with management fairness, and Item 7 was not associated with any of the fairness variables. When the fairness variables were added to the model with global job strain as the dependent variable, the regression weights for Items 1 and 2 were no longer significant (Table 5.15). Therefore, the relationships between each of these role conflict items and job satisfaction were fully mediated by the fairness variables. For Items 3 to 7, regression weights remained significant when the fairness variables were added (Table 5.15). However, the magnitude of regression weights was reduced by about 2 standard errors for Items 3, 4, and 6; by about 1 standard error for Item 5. The relationships between these items and global job strain were partially mediated by the fairness variables. As for Item 7, since it was not associated with none of the fairness variables, there was no mediating effect of fairness between Item 7 and global job strain.

	Model without fairness variables				Model with fairness variable				
Role conflict item	Reg. Weight	S.E.	Std. Reg weight	p	Reg. Weight	S.E.	Std. Reg weight	p	Mediation by fairness
1. Do things that are apt to be accepted by one person and not accepted by others	1.483	.619	.133	.017	.169	.594	.015	.776	Yes
2. Do things on the job that are against your better judgment	1.653	.562	.152	.003	.529	.539	.049	.327	Yes
3. Feel pressure to do things that you think may not be best	3.059	.581	.261	<.001	1.983	.565	.170	<.001	Partial
4. Receive conflicting requests from two or more people	2.231	.541	.207	<.001	1.167	.524	.108	.026	Partial
5. Your job leaves you with little time to get things done (originally a workload item)	2.530	.509	.248	<.001	2.006	.481	.197	<.001	Partial
6. Have to bend or break a rule or policy to carry out an assignment	2.319	.535	.202	<.001	1.236	.521	.108	.018	Partial
7. Too many different things to do at work (Cross loading on Workload)	1.310	.555	.121	.018	1.057	.510	.098	.038	No

Notes: Dependent variable was global job strain. Other stressors (i.e., workload, role clarity/vigilance, divided attention), social support from coworkers, and job control were controlled for.

Table 5.15: Regression weights for role conflict items on global job strain with and without fairness variables.

5.4 Psychological Well-Being

5.4.1 Main effect of fairness

The third outcome variable was psychological well-being, characterized as self-assurance as well as a lack of depression and anxiety. Table 5.16hows the regression results for the main effect models with psychological well-being as the dependent variable. Role conflict was the only stressor variable that remained significant in Models 1 and 2. Social support from coworkers had a significant regression weight in Model 2. As shown in table 5.17, when the fairness variables were added to the model one at a time (Models 3-1, 3-2, 3-3), each of the three fairness variables had a significant regression weight. Management fairness explained the largest amount of variance in psychological well-being (5.2%) among the three fairness variables. When three fairness variables were added to the model at once (Model 4 shown in Table 5.18), only management fairness and role conflict had a significant regression weight. All independent variables explained 27.7% of the variance in psychological well-being, considerably smaller amount than in other two dependent variables analyzed above.

	Model 1				Model 2			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Workload	-0.140	0.306	-0.032	0.647	-0.150	0.306	-0.035	0.623
Role conflict	-1.835	0.339	-0.420	<.001	-1.749	0.337	-0.400	<.001
Role clarity & Vigilance	0.193	0.290	0.077	0.506	0.096	0.293	0.038	0.742
Divided attention	0.321	0.526	0.066	0.541	0.362	0.525	0.075	0.490
Social support (coworkers)					0.497	0.192	0.130	0.010
Job control					0.112	0.231	0.028	0.630
adj. R2			0.207				0.225	
Change in adj. R2			--				.0.018	

Dependent variable: psychological well-being

Table 5.16: Regression results with psychological well-being as the dependent variable

	Model3-1				Model 3-2				Model 3-3			
Variable	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P	Reg. Weight	S.E.	Std. Reg weight	P
Workload	-.107	.304	-.025	.725	-.044	.297	-.010	.881	-.108	.302	-.025	.722
Role conflict	-1.510	.349	-.346	<.001	-1.373	.336	-.315	<.001	-1.533	.340	-.351	<.001
Role clarity & Vigilance	.072	.291	.029	.805	.066	.284	.027	.814	.162	.290	.065	.576
Divided attention	.313	.521	.065	.548	.362	.508	.075	.476	.300	.519	.062	.563
Social support (coworkers)	.441	.191	.116	.021	.393	.187	.103	.035	.459	.190	.120	.015
Job control	.062	.231	.016	.788	-.137	.230	-.035	.552	-.011	.232	-.003	.961
Supervisor fairness	.098	.041	.137	.017								
Management fairness					.206	.043	.270	<.001				
Wage fairness									.570	.192	.163	.003
adj. R2			.237				.277				.245	
Change in adj. R2 from Model 2			.012				.052				.020	

Dependent variable: psychological well-being

Table 5.17: Regression results including stressor variables, social support from coworkers, job control, and fairness variables

	Model 4			
Variable	Reg. Weight	S.E.	Std. Reg weight	P
Workload	-0.055	0.296	-0.013	0.854
Role conflict	-1.362	0.344	-0.312	<.001
Role clarity & Vigilance	0.087	0.285	0.035	0.761
Divided attention	0.326	0.509	0.068	0.521
Social support (coworkers)	0.375	0.187	0.099	0.045
Job control	-0.127	0.230	-0.032	0.579
Supervisor fairness	0.000	0.047	0.000	0.995
Management fairness	0.195	0.060	0.254	0.001
Fair wages	0.080	0.232	0.023	0.729
adj. R2			0.207	
Change in adj. R2			.052	

Dependent variable: psychological well-being

Table 5.18: Main effect model including stressors, social support, job control, and three fairness variables with psychological well-being as the dependent variable

5.4.2 Moderating effect of fairness

Interactions between role conflict and each of the three fairness variables were not significant (b = -.033, p = .536 for role conflict*supervisor fairness; b = -.026, p = .623 for role conflict*management fairness; and b = -.062, p = .240 for role conflict*wage fairness).

5.4.3 Mediating effect of fairness

Since the magnitude of the regression weight for role conflict did not decrease when fairness variables were added to the model (Models 3-1, 3-2, 3-3) compared to Model2, mediating effect of fairness between role conflict and psychological well-being.

5.5 Discussion

Cropanzano, one of the leading organizational justice researchers, and his colleagues (2005) contributed a chapter to the new edition of the Handbook of Work Stress (Barling, Kelloway, & Frone, 2005). Their chapter focused on the role of organizational justice and injustice in occupational stress process. Organizational justice was not included in the first edition of the handbook. This new chapter by Cropanzano and colleagues represents the emerging interests and needs for future research on fairness at work and the occupational stress process. The authors urge researchers to conceptualize organizational injustice not only as a stressor, but also as a moderator and mediator (Cropanzano, Goldman, & Benson, 2005).

The analysis presented in this chapter responds to the recommendation by Cropanzano and colleagues (2005). More specifically, the question of whether fairness is

associated with employee well-being after controlling for job stressors, social support from coworkers, and job control was examined first. Then the potential moderating or mediating role of fairness was explored. Because of the high correlations among various aspects of fairness identified in the previous chapter, the analysis was conducted focusing on the source of fairness (i.e., the supervisor, management) and fairness regarding wages. The regression analysis described above found that three types of fairness (i.e., the fairness of the supervisor, management, and wage) were significantly associated with job satisfaction, global job strain, and psychological well-being of the employees but in slightly different ways. The findings suggest the different roles fairness at work may take in the occupational stress process. The following discussion addresses the direct, mediating, and moderating effect of fairness at work. Limitations and suggestions for future studies are discussed in Chapter 6.

5.5.1 Direct effect of fairness at work

Employees' perceptions of fairness regarding the supervisor, management, and wage were all significantly associated with job satisfaction and global job strain. The three fairness variables explained a substantial proportion of variance in the job satisfaction and global job strain variables over and above traditional job stressors, job control, and social support from coworkers (14.7% and 9.1%, respectively). While employees' fairness perceptions of the supervisor and wages were not significantly associated with employees' psychological well-being, fairness of management was significantly associated with psychological well-being, explaining 5.2% of its variance.

Examining the direct effect of unfairness has been a common approach in the recent occupational health studies focusing on organizational justice (e.g., Elovainio, Kivimäki et al., 2002; Kivimäki, Elovainio, Vahtera, & Ferrie, 2003; Kivimäki et al., 2004). Most of these studies, including well-designed longitudinal studies, found an independent impact of unfairness on employee health outcomes after controlling for other factors known to influence employee well-being. This study confirmed that fairness at work was indeed significantly associated with employee well-being.

The mechanism of this inverse association between unfairness and employee well-being can be understood as the effect of a stressor on health. Since Selye's seminal work (1956), neuroendocrinologists have known that stressors, defined as environmental stimuli that are perceived as threatening, trigger increased catecholamine and corticosteroid secretion (i.e., the "fight-or-flight" response). These hormones are associated with an increase in heart rate and blood pressure (Carlson, 1998) and decreased immune functioning (Kiecolt-Glaser, 1999). Over the long term, these changes adversely affect physical health. Catecholamines also appear to affect cognitive functioning, emotion, and mood (Checkley, 1996), which may explain the association between exposure to stressors and a decline in psychological well-being. A few studies have found a link between endocrine changes and some coping behaviors. Findings suggest that increased corticosteroids may make people more vulnerable to drug abuse (Piazza & Le Moal, 1996) and binge eating (Epel, Lapidus, McEwen, & Brownell, 2001).

Significant positive relationships between job satisfaction and various types of organizational justice have been documented by a number of studies (e.g., Masterson, Lewis, Goldman, & Taylor, 2000; Mossholder, Bennett, Kemery, & Wesolowski, 1998).

Two meta-analyses (Cohen-Charash & Spector, 2001; Colquitt et al., 2001) found the population correlation coefficients between job satisfaction and distributive justice to be .47 and .56; procedural justice, .43 and .62; and interactional justice .41[8]. The zero-order correlations between job satisfaction and fairness at work measured in this study were similar in magnitude (.46 for fair wage, .55 for management fairness, and .47 for supervisor fairness).

Global job strain, or employees' general sense of how stressful their jobs are, has not been addressed in the organizational justice literature. However, it has been a main focus of research in the field of occupational stress. One of the important constructs that impact job strain is social support (House, 1981; Thoits, 1995; Viswesvaran, Sanchez, & Fisher, 1999). As presented in the previous chapter, fairness and social support were undistinguishable in this study. It is possible that fairness, in a similar way as social support, is beneficial to employees regardless of the presence or absence of job stressors.

Among the three types of fairness at work measured in this study, only fairness of management was significantly associated with psychological well-being, explaining a smaller portion of variance compared to the other two job-related outcomes. In this study, psychological well-being was operationalized as self-reliance and a lack of depression or anxiety. Although work is an important aspect of adults' lives, psychological well-being can be affected by non-job related issues such as family relationships, which were not measured in this study. This may be the reason for the less substantial association between fairness variables and psychological well-being.

[8] Colquitt and colleagues (2001)included interactional justice as part of procedural justice whereas Cohen--Charash and Spector (2001) categorized interactional justice separately. This different categorization may explain why Colquitt and colleagues (2001) found a larger population correlation coefficient.

While magnitudes of the relationship vary, this study found a significant main effect of fairness at work on all three employee well-being variables. At the same time, this sets the stage for exploring other potential roles that fairness may play in the occupational stress process.

5.5.2 Fairness as a mediator

The analysis presented above indicates a mediating role for fairness in the relationships of both role conflict and workload to employees' job attitudes (i.e., job satisfaction, global job strain). All three types of fairness (i.e., the supervisor, management, and wages) were significantly associated with both of the job stressors and the two outcomes variables. Including fairness variables in the model reduced the significant relationship between the stressors and the outcome variables. These relationships satisfy the operational definition of mediating effects (Baron & Kenny, 1986). This result suggests that the more employees experience conflicting demands or workload, the less likely they are to perceive fairness at work. This in turn results in employees feeling less satisfied with the job and perceiving the job to be more stressful.

Among the traditionally studied job stressors, workload may be the most intuitive and obvious: having too much to do is stressful. The mediating effect of fairness found in this study suggests that high workload may lead to perceived unfairness, which in turn results in dissatisfaction with the job. In an intervention to reduce workload for driving examiners, Meijman and colleagues (Meijman, Mulder, & Cremer, 1992, cited in Barling, Kelloway, and Frone, 2005) found that tension was higher at the end of the day among the high workload group than the low workload group. The authors noted in discussion

that the reduced tension associated with lowered workload might have been mediated by increased social support. Given the closely intertwined relationship between fairness and social support, the mediating effect of fairness between workload and job satisfaction found in this study provides supportive evidence for Meijman and colleagues' hypothesis. In this study, the data suggested that decreased workload may enhance perceived fairness, which then increases job satisfaction.

Role conflict is defined as the extent to which the employee experiences disagreements among various job-related demands (Beehr & Glazer, 2005). It has been found detrimental to employee well-being (e.g., Kelloway & Barling, 1991), which is consistent with the finding of this study. The perceptions of fairness in response to experiencing role conflict may be related to the specific source and mechanism of conflict. Since supervisors and management establish and enforce role expectations for employees, they play a central role in creating role conflict (Kelloway, Sivanathan, Francis, & Barling, 2005). As summarized in Kelloway and colleagues' review (2005), different mechanisms of conflict include inter-role conflict (i.e., conflict between different roles the employee holds), person-role conflict (i.e., conflict between role expectations and the employee's personal values), inter-sender conflict (i.e., conflict between role expectations from different supervisors or management), and intra-sender conflict (i.e., conflict between different sets of expectations from the same supervisor/management). If the supervisor issues conflicting job demands (i.e., intra-sender conflict), perceptions of the supervisor's fairness may decline. If some workplace policies do not agree with the employee's personal values (i.e., person-role conflict), the perceptions of fairness from management, who makes the policies, may diminish. If the

supervisor and management have incompatible job requirements (i.e., inter-sender conflict), employees may find the supervisor, management, or both unfair. Role conflict independently accounted for nearly a quarter (23%) of the variance in supervisor fairness, and 18% in management fairness. The difference in the amount of variance explained by role conflict may indicate that the supervisor creates role conflict more than management. In this study, however, the participants were not asked to identify who they perceive as responsible for their conflicting demands.

Items in the role conflict measure used in this study (adapted from Hurrell & McLaney, 1988; originally from Rizzo, House, & Lirtzman, 1970) address different types of role conflict. Examining the mediating role of perceived fairness between each of the items and the two outcome variables (i.e., job satisfaction, global job strain) indicated that the following types of conflicts may be fully mediated by fairness perceptions: conflict between personal value and job tasks (i.e., "do things that are against your better judgment") and conflict between role senders (i.e., "do things that are accepted by one but not accepted by others). This result suggest that if these types of conflict were reduced, employees' perceptions of fairness may enhanced.

Role conflict accounted for a small (8%) but significant amount of variance in perceptions of fair wages. The more role conflict employees experience, the less likely they are to perceive that management is concerned about a fair wage, which in turn leads to less satisfaction with the job and more perceived stressfulness of the job. This result may suggest that employees expect compensation for the role conflict they experience. That is, if they have to be exposed to conflicting job demands, the resulting distress should be reflected in higher wages. This expectation can be explained by the effort-

reward imbalance (ERI) model (Siegrist, 1996), one of the major occupational stress models. The ERI model is based on the expectation of social reciprocity, characterized by mutual cooperative investments in which efforts are equalized by respective rewards. When this expectation is violated—that is, if the employee's efforts on the job are not rewarded—the ERI model claims that negative emotional reactions and sustained stress responses are elicited. Consequently the employee's health and well-being are compromised. This model has been tested in various work settings and supportive evidence has been reported regarding various health outcomes (see Tsutsumi & Kawakami, 2004 for recent review).

The ERI model is similar to the equity theory of distributive justice (Adams, 1965): both theories assume that employees' assessment of input-to-output ratio evokes emotional reactions. However, an important difference between the two theories is the reference point against which employees' input-to-output ratio is evaluated. Equity theory explicitly brings in the referent other who is similar to the employee in the amount of input. If the employee perceives that the referent other's input-output ratio is the same as his or her own, the output is considered fair. In contrast, the ERI model does not have any explicit reference in assessing the balance between effort and reward. In practice, the imbalance is mathematically calculated from employees' ratings of efforts and rewards (Pikhart et al., 2001). This difference is important because if all employees with similar qualifications and job responsibilities perceive that they are underpaid, theoretically equity theory would not detect unfairness while the ERI model would.

Effort in the ERI model are typically measured by the employee's perceptions of job demands such as workload, time pressure, physical demands, obligations and

responsibilities. Rewards include salaries/wages, evaluation from the supervisor and coworkers, support from the supervisor and coworkers, and promotion opportunities. According to the ERI model, the more effort the job requires, the more rewards the employee expects. While the ERI model focuses on health consequences when employees experience an imbalance between effort and reward, the same imbalance also invokes a sense of unfairness. Since employees are more likely to experience role conflict when they have many job demands than when they have fewer demands, it is also likely that employees with high role conflicts expect higher wages, which results in perceived unfairness regarding pay.

The mediating role of fairness between role conflict and two types of employee well-being suggests that unfairness could be decreased through reducing role conflict, which may enhance job satisfaction and alleviate job strain. In order to reduce role conflict, management and supervisors should first identify sources and mechanisms of role conflict. Is the conflict between conflicting demands from the supervisor, disagreement between the supervisor and management, or incongruity between job requirements and employees' personal values? Necessary changes may differ according to the type of role conflict experienced by employees.

5.5.3 Fairness as a moderator

The analysis found that perceived fairness about wages moderates the relationship between workload and job strain. As illustrated in Figure 5.1, when workload is low, fairness about pay is not associated with levels of job strain; however, when workload is high, employees who perceived that management was not concerned about paying them

what they deserve had higher job strain than those who perceived that management was concerned about fair pay.

Many studies have found a significant association between workload and employee well-being. The measure for workload used in this study reflects the extent to which employees perceive that they have to work very fast, very hard and that there are too many things to be done (adapted from Hurrell & McLaney, 1988; originally from Karasek, 1979). While this type of workload has been commonly studied as a predictor of cardiovascular diseases (Schnall et al., 1994), it has also been found an important factor for a wide array of employee health outcomes (see de Lange, Taris, Kompier, Houtman, & Bongers, 2003 for review). In well-designed longitudinal studies, workload has been shown as a predictor for job satisfaction (e.g., Paul E Spector, Chen, & O'Connell, 2000), psychological distress (e.g., Bourbonnais, Comeau, & Vezina, 1999; e.g., Steptoe et al., 1998), burnout (e.g., Schaufeli & Bakker, 2004), and physical health complaints (Carayon, 1993).

The most widely studied moderators of the relationship between job stressors and employee health outcome are job control and social support. One of the influential models of occupational stress, the demand-control model (Karasek, 1979), claims that job demands (i.e., workload, time pressure, and role conflict) are detrimental to employee health only when employees do not have control over their jobs. Empirical support for this model has not always been consistent, but a number of studies have found the moderating effect of job control in various work settings (see de Lange et al., 2003 for review). In this study, job control had a significant main effect only with global job strain, after controlling for social support and fairness. The moderating effects of job

control between two significant stressors (i.e., workload, divided attention) and global job strain were not supported by the data.

Social support was later added to the demand-control model as a third dimension of job characteristics that have significant impact on employee health (Johnson, Stewart, Hall, Fredlund, & Theorell, 1996). The revised model, now called the demand-control-support model, sees job strain as a result of exposure to high job demands, low control, and low social support from the supervisor and coworkers. Empirical support for this three-way interaction has been scarce (hence some authors write "the demand-control-(support) model"). Parkes and colleagues (1994) did find the three-way interaction significant in two groups of employees (i.e., healthcare workers and student teachers). In this study, social support from coworkers had a significant main effect on global job strain and psychological well-being, but moderating effects of support from coworkers between stressors and the two outcomes were not supported by the data. The three-way interaction among stressor, job control, and support was not examined.

As discussed in Chapter 4, the data suggested that employees' perception of fairness at work was intertwined with social support. If perceived fairness of the supervisor and management are closely connected to social support, the demand-control-support model suggests a moderating effect of fairness in the relationship between workload and global job strain. However, the data found that fairness of the supervisor and management did not affect the stressor-strain relationship. Instead, fairness regarding wages had the only significant moderating effect, with high workload accompanied by unfairness regarding wages being associated with high job strain. This finding supports the ERI model of job stress.

Within the newly growing literature on fairness at work and employee health, no study has addressed the potential moderating effect of distributive justice. Although it is limited, support for a moderating role of distributive justice was found in the organizational justice literature. Brockner and Wiesenfeld (1996) identified 45 field and laboratory studies in which an interaction between distributive justice and procedural justice had been found. In their review, Brockner and Wiesenfeld (1996) encouraged researchers to consider three possibilities in interpreting the interaction: 1) distributive justice as a moderator between procedural justice and outcome, 2) procedural justice as a moderator between distributive justice and outcome, and 3) a specific combination of distributive and procedural justice levels elicits a specific outcome that is different from any other combination.

The most common interpretation of the interaction between the two types of justice is that procedural justice perceptions moderates the relationships between distributive justice perceptions and employee outcomes (Brockner & Wiesenfeld, 1996). This may be appropriate for many studies in the organizational justice literature because they typically measure specific outcomes (i.e., the most recent raise) and the fairness of the procedure that derived the outcome (i.e., the last performance appraisal). For example, if the employee feels that the raise was not fair but that the supervisor employed a fair performance appraisal procedure, he or she may have a more favorable attitude toward the job compared to those who feel that the raise and appraisal were both unfair. Recently Greenberg (2004) proposed a model of organizational justice and occupational stress in which distributive injustice was seen as a stressor and procedural justice as a buffer or moderator.

Despite this mainstream interpretation of the interaction, Tepper (2001) hypothesized distributive justice to be a moderator between procedural injustice as a stressor and psychological distress. Interaction between distributive and procedural justice was significant on all outcomes (i.e., emotional exhaustion, anxiety, and depression) in two independent samples. The direction of interaction was as expected: when exposed to procedural injustice, employees were more distressed if distributive justice perceptions were low; but if distributive justice was high, procedural injustice did not affect employees' psychological distress. If procedural injustice is considered as a stressor, Tepper's results are consistent with the finding from this study. Both studies suggest that distributive justice moderates the relationship between stressors and employee well-being

Tepper's study (2001) was unique in other aspects. While almost all organizational justice studies focus on employees' attitudes toward or behaviors in organizations (i.e., organizational commitment, job performance) as outcomes, Tepper (2001) examined health consequences of injustice. In addition, rather than specific events, he measured general perceptions of fairness regarding pay and formal procedures. Tepper's study (2001) therefore provides supporting evidence for the claim that this dissertation proposes: general perceptions of fairness rather than fairness of specific events have impacts on employees' health.

Another moderating effect of fairness was tested in the relationship between role conflict and psychological well-being. The data did not suggest that the level of perceived fairness of management impacted the relationships between role conflict and psychological well-being. There has been only one study (Zohar, 1995), to the best of

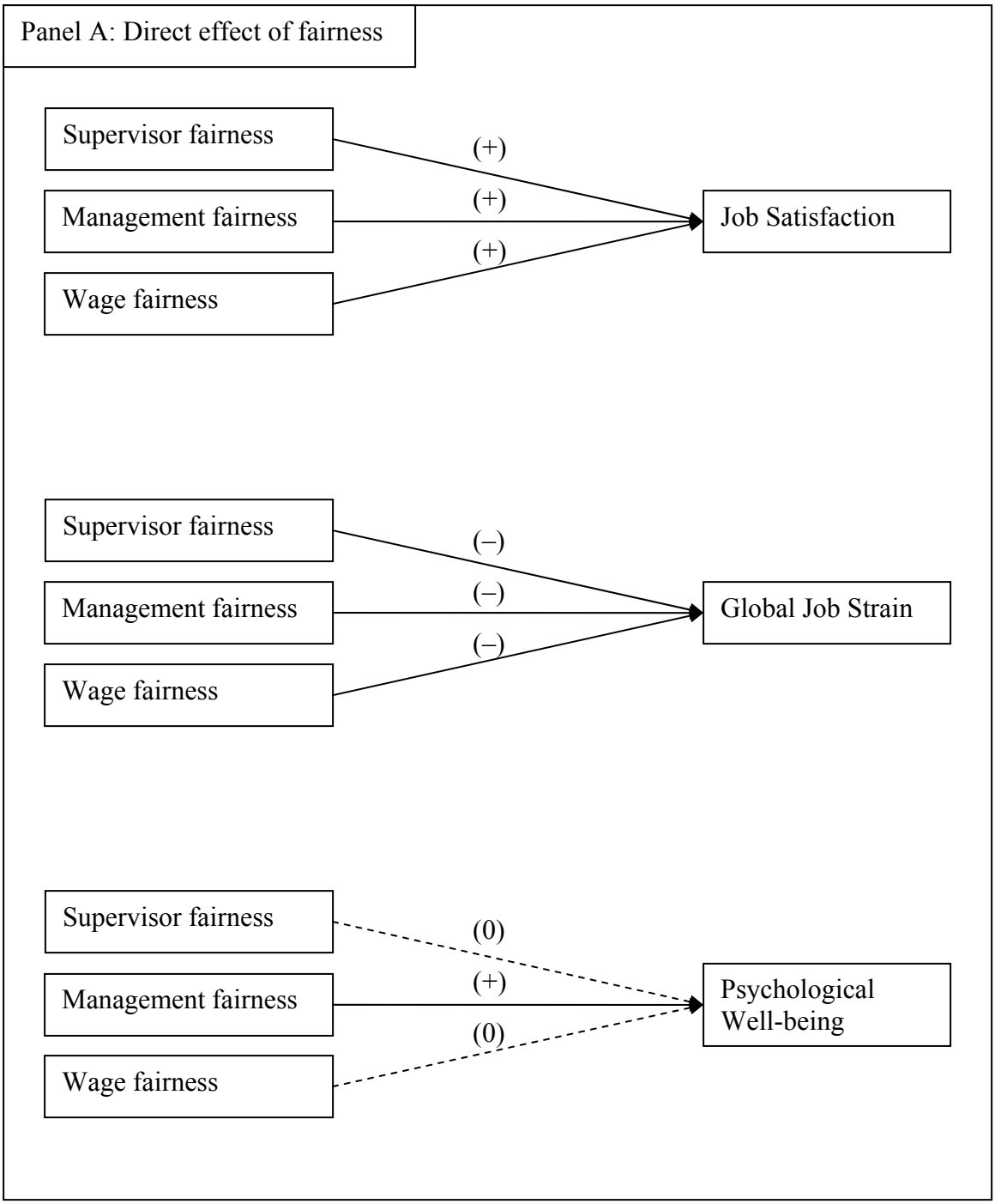
my knowledge, that examined moderating effects of fairness in a workplace. The result was consistent with this study. In his study of 213 hospital nurses, Zohar (1995) found significant main effects of role conflict and perceived fairness of the role sender (i.e., the supervisor) on psychological well-being measured with the General Health Questionnaire (Goldberg & Williams, 1988), the same measure used in this study. The amount of variance in psychological well being explained by perceived fairness of the role sender was 6%, similar to this study (i.e., 5.2%). Zohar's data did not support a significant moderating effect of fairness between role conflict and psychological well-being.

Zohar (1995) hypothesized that fair behavior of the role sender would alleviated detrimental consequences of role conflict, but he did not examine the mediating effect. This has been criticized by several organizational justice researchers (e.g., Cropanzano et al., 2005; Vermunt & Steensma, 2001) who are interested in the role of fairness in the occupational stress process. As discussed in the previous section, the fairness of the supervisor mediates the relationship between role conflict and its consequences. In this study 23% of variance in the supervisor fairness was explained by role conflict. That is, role conflict itself may be a major determinant of employees' perceptions of the supervisor's fairness.

5.5.4 Summary: Different roles of fairness at work

The three panels in Figure 5.2 highlight the findings in this study. Panel A illustrates the main effect of fairness. This is shown as pathway A in the research model (Figure 2.3). Panel B represents the mediating effect of fairness between role conflict and employee well-being. This corresponds with pathways A and B in the research

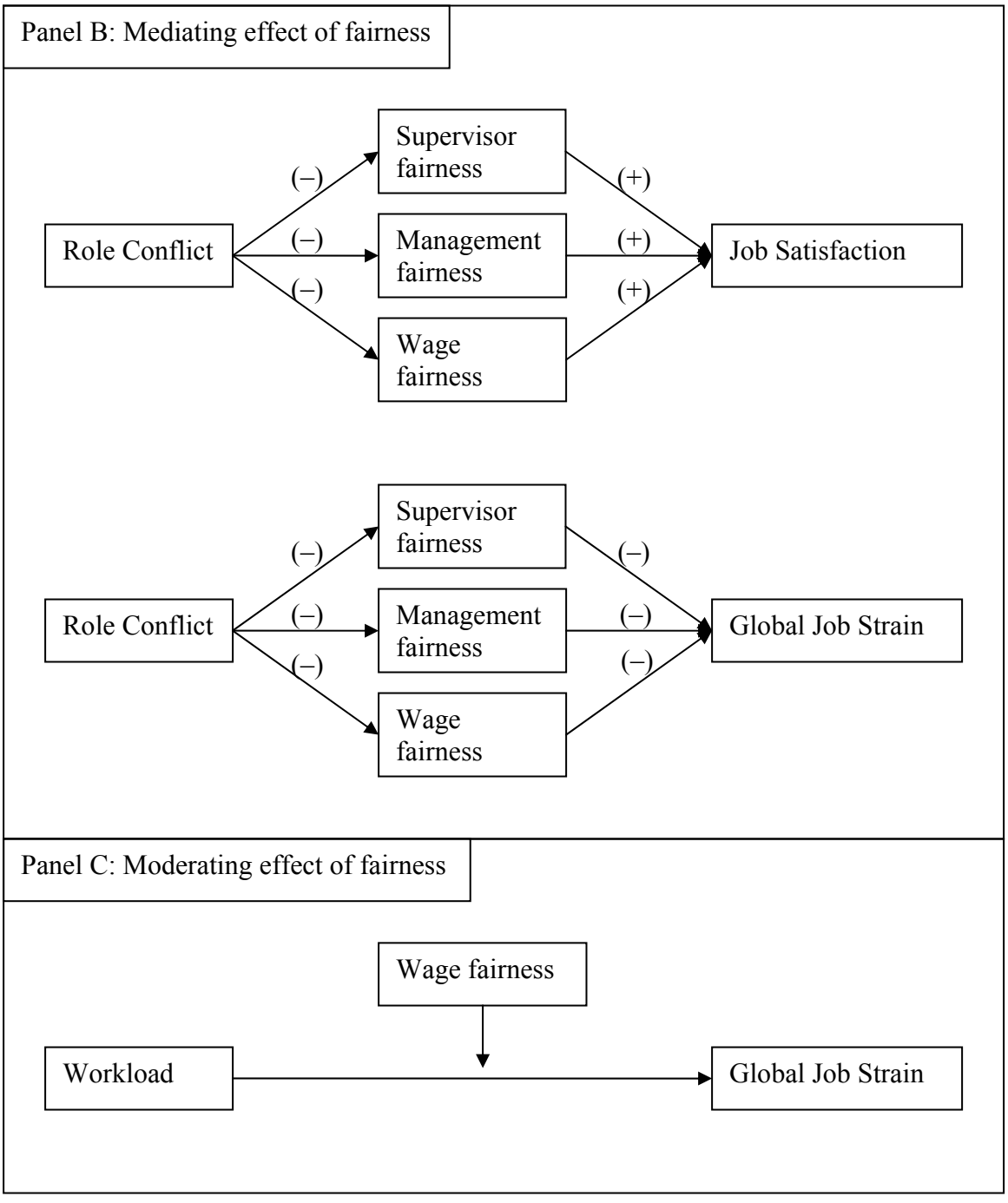
model. Finally, Panel C shows the moderation effect of fairness regarding wages between workload and global job strain, which corresponds with pathway C in the research model. All three pathways in Figure 2.3 are supported by the data. Data also indicated that different types of fairness play different roles in various stressor-strain relationships.



Continued

Figure 5.2: Relationships between fairness at work and employee well-being. (+) indicates positive relationship, (-) negative relationship, and (0) non-significant relationship. The dotted line (- - -) indicates non-significant relationship.

Figure 5.2 continued



CHAPTER 6

CONCLUSION

6.1 Summary of major findings: Brief answers to the five research questions

Five research questions were presented at the end of Chapter 2. Each question was discussed in detail in Chapters 4 and 5. As a summary of the findings from this study, a brief answer to each of the research questions is presented below:

1) What is the nature of employees' day-to-day experience of fairness at work?

Two sources of fairness, the front line supervisor and upper management, were perceived separately by the employees. Their perceptions of fairness from the supervisor and management five aspects in common: (1) the supervisor/management's treating employees in ways that they do not deserve. (2) the supervisor/management's appreciating and recognizing good work, (3) the supervisor or management's taking employees' viewpoint into account by allowing voice in decision making, (4) the supervisor/management's willingness to accommodate employees' personal needs, and (5) the supervisor/management's being concerned about employees' job-related well-being. These five aspects of fairness were highly correlated with each other. In addition, fairness regarding wages was identified as a component of management fairness.

2) What are the relationships among fairness, control, and social support?

While the employees perceived job control and fairness had some unique components, social support from the supervisor was indistinguishable from perceptions of fairness from the supervisor. Job control was correlated in expected directions with all five aspects of fairness at work, but the magnitude of correlation was moderate.

3) Does fairness contribute to explaining employee well-being over and above the effects of established occupational stressors, social support, and control?

Yes. Fairness variables explained a significant amount of variance in each of three employee well-being variables (i.e., job satisfaction, global job strain, and psychological well-being). The magnitude of association varied depending on the stressor-strain combination and the type of fairness. Perceptions of fairness from management were consistently associated with all three employee-well-being variables.

4) Does fairness mediate the relationship between stressors and employee well-being?

Yes. Fairness at work mediated the relationship between role conflict and job-related well-being (i.e., job satisfaction, global job strain).

5) Does fairness moderate the relationship between stressors and employee well-being?

Yes. Fairness regarding wages moderated the relationship between workload and global job strain. The Different types of fairness had different functions in various stress-strain combinations.

6.2 Striving for fairness at work: Implications for workplace interventions

This study identified several aspects of fairness at work and ways fairness may relate to some stressors and strain. Based on these findings, some implications for workplace intervention are discussed below.

The organizational justice literature provides guidelines to help managers conduct formal organizational processes in a fair manner, such as using accurate information for decision making, applying rules consistently, and suppressing personal biases (Leventhal, 1980). However, fairness in daily interactions between management and employees has not been addressed in this literature. This study found that fairness in daily interactions with the supervisor and management is associated with employee well-being. This type of fairness perception has six highly related components. Based on these factors, the following should be emphasized in leadership training in work organizations: showing appreciation for good work, listening to employees, accommodating individual employees' unique needs, and making it clear that employee well-being as a responsibility for the supervisors and management. The supervisor's and management's efforts to incorporate these in their daily interactions with employees are likely to increase employees' perceived fairness at work.

This study also found that fairness mediates the relationship between role conflict and job-related employee well-being. This suggests that reducing role conflict would result in enhanced perceptions of fairness, and in turn enhanced well-being. A strategy to reduce role conflict starts with identifying the sources of role conflicts, clarifying priorities among the conflicting demands, and communicating clearly these priorities to employees.

Another finding was that employees' perception of management's concern about paying fair wages moderates the relationship between workload and job strain. In theory, there are three ways of addressing this situation: reducing the workload, increasing the wages, or changing the perception of management's concern about wages. The first two approaches are costly to the company, and management will be reluctant. Convincing management would require a thorough economic analysis. Although changing employees' perception of management's concern may be difficult without actually increasing wages, one study provides a suggestion. In his laboratory experiment, Greenberg (1993c) found that underpaid study participants' negative reactions were minimal when they were informed how their pay amount was determined and the news was given in a sensitive manner. This strategy may be applicable to actual work organizations. When management wishes to increase employees' perceived fairness regarding their wages without actually increasing the amount, management could show their sincere regret for not being able to pay employees more, as well as explain in detail how their pay schedule was determined, and why they cannot be paid more.

In addition to its direct impact on employee health and well-being, fairness at work may play an important role in the success of workplace health promotion program in general. Greenberg (1994) documented that worksite smoking bans were more likely to be accepted when the policy was created and announced in a fair manner. Employees, even heavy smokers, rated the policy more favorably when management included employees in the decision-making process, explained how and why the decision was made, and showed concern and sensitivity for those who would be adversely affected (i.e., employees who smoke). Heaney and Joarder (1999) found in their qualitative study that

employees who perceive that their organizations are treating them unjustly are more likely to be critical of the health programs and initiatives offered through the organization. Employees' reactions to workplace health interventions are important for effective health promotion. These studies suggest that fairness is a determining factor in the acceptance of workplace health interventions. Therefore, it is important for public health researchers and professionals to address fairness at work.

6.3 Research questions for the future

As is often the case, answering some questions creates an array of new ones. In this section, two major directions for future research are proposed.

6.3.1 Unique contribution of fairness in the occupational stress process

Without any specific context, the concepts of fairness, social support, and control are distinct: fairness encompasses moral rightness, equity, honesty, and impartiality; social support refers to positive social interactions intended to be helpful; and control is to be able to exert influence over one's environment. However, in this study, fairness and support from the supervisor were indistinguishable, and a substantial overlap existed between fairness and job control. Figure 6.1 illustrates the overlap among fairness, social support from the supervisor, and job control based on the relationship between one of the outcome variables (i.e., job satisfaction) and the three constructs found in this study[9].

[9] The size of each circle indicates the zero-order correlation between job satisfaction and each variable. The magnitude of overlap was estimated using semipartial correlations between job satisfaction and each of the three variables. For example, the zero-order correlation between job satisfaction and job control is .280; the semipartial correlation between job satisfaction and job control after the linear influence of fairness and social support are partialled out from both job control and job satisfaction was .158. To

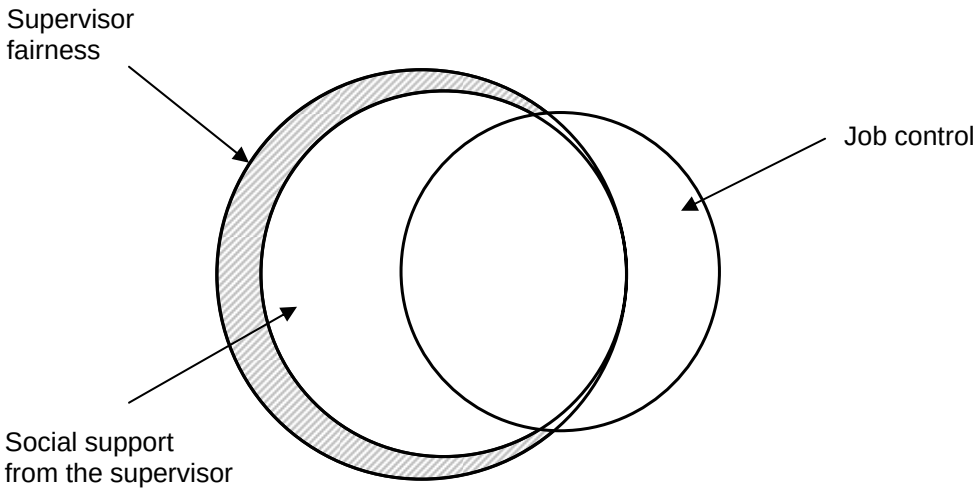


Figure 6.1: Overlap among supervisor fairness, social support from the supervisor, and job control.

This substantial overlap among the three constructs makes it difficult to clarify the role of fairness in the occupational stress process. Social support and job control have been studied for several decades, and their roles in the occupational stress process (i.e., as a stress buffer) have been well-identified. The unique contribution of fairness (the shaded area in Figure 6.1) needs to be identified carefully. What behavior is perceived as fairness but not as support or job control? Revising or recomposing the fairness measure is a necessary step to address this question. In fact, the substantial overlap found in this study may have been resulted from the way the fairness measure was generated. The Heaney & Joarder qualitative study (1999), which provided the source of fairness items, did not address control or social support explicitly. Therefore, it is possible that the

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indicate these correlations as an area of a circle, $(.158)^2 / (.280)^2 = .318$; that is, 31.8% of the circle is the unique contribution of the job control variable in explaining job satisfaction.

interviewees provided information that falls into the overlap of the three circles and not in the shaded area in Figure 6.1. A qualitative study that included questions addressing fairness as well as support from the supervisor and control over work will help develop a measure that distinguishes the unique contribution of fairness at work in the occupational stress process.

6.3.2 Fairness vs. unfairness

In the organizational justice literature, fairness and unfairness are assumed to be two poles of a single continuum; therefore, it has not been explicitly examined whether or not the absence of fair treatment is the same as the presence of unfair treatment. In his discussion on injustice and disrespect, Miller (2001) proposed two conceptualizations of injustice: being deprived of what one deserves and being subjected to what one does not deserve. An example of the former occurs when the supervisor does not acknowledge employees' good work. An example of the latter is when the supervisor ridicules an employee in public. How the presence and absence of fair and unfair treatment are perceived by the employee and whether or not they function similarly in the occupational stress process are empirical questions for future research.

Research on social support and social undermining may inform the effort to answer this question. As discussed above, social support and fairness are intertwined concepts. Within the well-established literature of social support, some studies have investigated the relationship between social support and social undermining, or negative social interactions (e.g., Rook, 1990; Vinokur & van Ryn, 1993). An inverse relationship is intuitively expected between social support and social undermining. In a meta-analysis,

Okun and Lockwood (2003) found that the magnitude of expected inverse relationship varied as to how specific the source of social support/undermining was assessment. When support and undermining from specific individuals (e.g., spouse) were assessed, the inverse relationship between social support and social undermining was stronger than support and undermining were measured in general social network of the focal person (r = -.43 and -.08, respectively). While the appropriateness of assessing social support and undermining specific or general is an ongoing debate among social support researchers (see Wills & Shinar, 2000), social support and social undermining are not the two poles of a unidimensional scale.

The presence of support does not necessarily indicate the absence of undermining, and vice versa. Employees' perceptions of fairness and unfairness at work may have a similar relationship. The same supervisor could be fair and unfair, depending on the situation. For example, the supervisor may acknowledge employees' good work, but he may also demand unpaid overtime. Separate effects of social support and social undermining on health and well-being have been investigated. Some studies have provided evidence that the negative impact of social undermining on health is greater than the benefit of social support (e.g., Duffy et al., 2002; Finch et al., 1999; Vinokur & van Ryn, 1993). If this is analogous to fairness/unfairness, exposure to unfairness may have more influence on health than fairness.

If fairness and unfairness are indeed separate dimensions, promoting fairness may not automatically result in eliminating unfairness. Intervention efforts must be focused on both promoting fairness at work and decreasing unfairness. Their relative importance

to employee health and well-being needs to be assessed so that interventions can be directed to the more important direction.

6.3.3 Other potential relationships between fairness and well-being

The roles of fairness/unfairness as a stressor, mediator, and moderator were examined in this study. There are other potential relationships that fairness may have with other factors in the occupational stress process. First, there may be some factors that moderate the relationship between fairness and well-being. A highly probable candidate is social support from coworkers. Although the buffering effect of social support is not always supported by data, it is likely that social support is generally beneficial to individuals under stress. Support from coworkers may alleviate the negative impact of unfairness at work.

Second, the relationship between fairness and control needs to be explored. Control at work, or the extent to which employees have control over how they do their job tasks, was correlated to fairness but not strongly. Control *over* work, which is related to "power over the whole working process" (Theorell, 2002, p. 206), may have an intricate relationship with fairness. As discussed in Chapter 4, control is implied in voice, an important component of perceived fairness. A lack of voice in a procedure is considered unfair because, at least partly, it limits one's control over the outcome derived through the procedure (Lind & Tyler, 1988; Thibaut & Walker, 1975).

A lack of control is detrimental to employee health, according to the demand-control model (Karasek, 1979). The relationship between control and health may be mediated by perceived fairness. In a longitudinal study of hospital employees, Elovainio

and colleagues (Elovainio et al., 2004) found that procedural justice operated as a mediator in the relationship between medically certified sick leave and job control[10]. The more job control employees had, the more likely they were to perceive that managerial practice was fair in terms of suppressing biases, applying roles consistently, using accurate information, and being ethical. High levels of perceived procedural justice were associated with less frequent sickness absence.

A further task for future researchers is to identify mechanisms through which fairness at work impacts employee health and well-being. Another study conducted by Elovainio and colleagues (Elovainio, Kivimäki, Vahtera, & Keltikangas-Järvinen, 2003) examined various health-related behaviors (i.e., smoking, alcohol consumption, and sedentary lifestyle) as potential mediators between unfairness and health. Their data did not support a mediating role of these behaviors. This null finding, however, may have been specific to the study population. All participants were employees of the Finnish national healthcare system. It is likely that the prevalence of health-compromising behavior was lower than in the general Finnish population. In addition, social desirability bias may have played a role in reducing variability in health behavior measures. The employees of the national healthcare system may have been reluctant to report their unhealthy behaviors to a health research project lead by the government. Further examination of the potential mediating role of health behavior is needed. Examining various potential relationships between fairness at work and health will greatly contribute

[10] Elovainio and colleagues' operationalization of job control was based on the demand-control model, in which control was a combination of skill discretion (i.e., opportunities to learn and develop ones skills, defined in Karasek, 1979) and decision authority (i.e., ability to make decisions regarding what needs to be done and how it should be done, defined in Karasek, 1979).

to accumulating knowledge in the occupational stress literature as well as informing intervention strategies that enhance employee well-being.

6.4 Limitations of the study and recommendations for future research

This study has several methodological limitations as discussed below. They must to be taken into consideration when interpreting the results.

Study design. In exploring the various roles of fairness at work within the occupational stress process, the most significant limitation of this study is its cross sectional design. Although the research questions imply causal links, causal inferences should not be made based on this study. A cross sectional design prohibits not only testing hypothesized causal relationships but also exploring other types of causality (i.e., reverse causality, reciprocal causality). For example, it is very much possible that employee health and well-being affect perceptions of and actual exposure to job stressors. In addition, available coping resources may vary as a result of health status (e.g., a depressed employee may stop going out with friends after work and thus minimize available social support). These possibilities should be explored in longitudinal studies.

In addition to its inability to test causal relationships, the cross sectional design makes it difficult to detect the buffering effect that fairness may have in the relationship between job stressors and employee well-being (House, 1981). The current level of employee health may reflect both current and past exposure to job stressors, and the effects of past and present exposure to job stressors may have been moderated by fairness. Since past

exposure to job stressors was not measured in this study, the moderating effect of fairness between the past job stressor and current employee health may appear as the main effect of fairness. In this study, the only significant moderating effect was that by fairness regarding wages between workload and global job strain. This moderating effect seems robust. Other combinations of moderating effects may be detected in well-designed longitudinal studies.

Common method variance. Since all study variables were measured in a questionnaire, another methodological problem is common method variance. Correlations among study variables may be inflated by response consistency due to dispositional or situational factors (Lindell & Whitney, 2001). Although acquiescence bias was statistically controlled for in the analysis, it is desirable to obtain other types of information to assess work characteristics and employee health.

Multiple hypothesis testing

Another methodological concern is testing a large number of models simultaneously. As the number of models increase, the likelihood of committing Type I error increases (Shaffer, 1995); that is, significant results may have occurred just by chance. Among several approaches for addressing this problem (see Shaffer, 1995 for review), the most commonly used is the Bonferroni method. This method adjusts the significance level according to the number of hypotheses tested so that the overall chance of making Type I error is .05 (or a value of the investigator's choice). The significance level for individual testing is therefore smaller (e.g., if 20 hypotheses were tested

simultaneously, the individual alpha level = .05/20 = .0025). As shown in Chapter 5, most of the significant results had a p-value of less than .001, but a few had slightly greater p-values (e.g., p = .017 for the interaction term between workload and wage fairness). These results should be specifically tested in a new data set in order to determine whether or not substantial relationships exist beyond chance level. The ambiguity of interpretation of the significant results in this study due to the large number of models tested can be justified by this study's exploratory nature. An important contribution of this study is to generate more specific hypotheses for future research.

Stress appraisal, coping responses, and non-occupational stressors. Although the conceptual framework is based on the transactional model of stress (Lazarus & Folkman, 1984), the main concepts of the transactional model—appraisal and coping—were not measured in this study. Also not measured were other factors that are likely to influence stress and coping processes, such as personality, trait anger, and negative affectivity. While this would be a serious flaw in a psychological study, this study did not focus on individual differences in dealing with stressors. Rather, the purpose was to examine the importance of fairness for employee well-being, regardless of individual differences in stress appraisals and coping styles. Understanding fairness at work as the experience of the study participants in general provided insights into potential workplace interventions that enhance employee health and well-being.

Likewise, non-occupational stressors (e.g., marital dysfunction, child/elder care) were not assessed in this study because the goal of this study was to better understand the role of fairness in occupational stress processes. Since most adults spend a substantial

amount of time at work, what happens there can have a significant impact on their physical and mental health. Work is a major source of chronic stress in adults' lives: it is more strongly associated with health than are family and financial problems are (NIOSH, 1999).

Developing a fairness measure from a qualitative study. It is a recommended practice in developing a measure to start with what the target population has to say about the construct of interest (Streiner & Norman, 1995). This study followed this recommendation, but the source of items and the study participants were not the same type of employees. The qualitative study by Heaney and Joarder (1999) was conducted with employees in various occupations, including personnel in healthcare, information technology, library, security, and administration, all employed by a large university. The fairness questionnaire items were derived from interviews with these employees. The participants of this study were almost all men in furniture warehouses. The university employees' experience of fairness and unfairness obviously resonated with the warehouse employees', judging from the goodness of fit of the CFA models, the proportion of variance of each item explained by fairness factors, and some comments employees made during the data collection. However, warehouse employees may experience some other aspects of fairness that were not included in the questionnaire. Future qualitative investigations will confirm whether or not the items used in this study cover all aspects of fairness in various occupations.

In the CFA analysis to identify the underlying structure of fairness at work, a data-driven approach was taken. This limits generalizability of the final models in

exchange for better fit to the current data. Since this was an exploratory study, the resulting models should be tested with new data sets in future studies.

Study sample characteristics. There are several concerns when generalizing the findings from this study. Data were collected from a specific occupational group (i.e., manual material handling employees) in a single industry. A vast majority of the study participants (97.2%) were men. Thus, the results may not be applicable to other occupational groups or to women. The CFA models for fairness at work must be tested with data from different types of employees.

While the study sample was homogeneous in terms of occupation and sex, it included various racial and ethnic backgrounds. Caucasians, including a few Eastern European immigrants, did not make a majority (47%). In addition to African Americans (26%) and Latinos (16%), the sample included small numbers of Native Americans, Asian Americans, and Africans. It was not examined, however, whether different racial and ethnic groups perceive fairness at work differently. Significant results from a heterogeneous group give researchers confidence about the findings, but there may have been various culture-specific aspects that this study was not able to capture. Given immigrant workers' vulnerable situations in the US or any other dominant society, their experience of fairness at work is an important research topic.

Partly related to this cultural diversity, the participants' literacy level was a concern. Immigrants from non-Spanish speaking countries (e.g., Middle Eastern, Eastern European) completed the English survey. Some of them needed the questions to be read aloud. In total, twenty out of 357 participants needed the questionnaire read aloud, and

some others struggled to complete the survey. An investigation of missing data patterns suggested a potential influence of literacy levels on missing data. Although the readability of the survey questions was set at the eighth grade level, there tended to be more missing data points when the question item was long. This raises questions about potential bias. This is especially problematic when factor scores were used in the analysis, which did not account for measurement error. Some question items must be revised to increase readability.

Selection bias at the worksite level was a concern. The participating companies may have allowed data collection only at "good" worksites in terms of employee-management relationships. The results may reflect only fairness at good workplaces. At the individual level, the "healthy employee effect" (i.e., stressed employees do not volunteer to participate) is unlikely because very few employees in the participating facilities were missed (response rate: 95.7%).

Besides these limitations, this study has several strengths which other studies examining fairness and health do not. First, fairness at work was measured with inductively developed fairness item. The items in the scale were not constrained by the traditional concepts of organizational justice, and therefore were appropriate to capture employees' day-to-day experience of fairness at work. The CFA models of fairness at work identified the aspects of social interaction with the supervisor and management that are important to employees' perceptions of fairness at work. Second, the confirmatory factor analysis was conducted not only for fairness items but for all but two measures used in the study. This ensured the goodness of indicators. In fact, some items from

well-established measures of workload and role conflict were used as indicators of factors other than originally intended (see Appendix B). While this limits the generalizability of the findings, the underlying concepts were better indicated by these rearranged items. Therefore the relationships found among the factor score variables better reflect perceptions of the current study sample. Third, the data were analyzed to identify moderating and mediating effects of fairness at work. Information on these relationships is especially useful for developing intervention strategies.

Work organization, or the way jobs are structured and managed, affects employees' health and well-being in various ways. This dissertation found that fairness at work may have a direct impact on employee health regardless of the level of job stressors, may result from role conflict, and may buffer the adverse effect of high workload. It also found that a fair workplace can be characterized by appreciation, receptivity, individualized concern, general concern, lack of mistreatment, and fair wages. These findings support part of the conceptual model integrating work organization and fairness at work in the occupational stress framework. This framework can be used to guide future investigations of fairness and health in the workplace.

APPENDIX A

MEASURES

This is an excerpt from the survey instrument used in the NIOSH funded project. This excerpt includes the instructions given to the participants and measures used in this study.

Low Back Pain Survey

The Ohio State University
College of Engineering and School of Public Health

This survey is part of a study being conducted by the Ohio State University College of Engineering and School of Public Health in order to better understand low back pain among workers like yourself. This survey asks about your health, your job, and your feelings about your job.

Your participation is voluntary and your responses will be kept completely confidential. Your responses will not be seen by anyone except research staff at the Ohio State University. Only overall results of the survey will be reported publicly. This means that no one at your company will know how you responded to these questions. Your answers to the questions in the survey will not have any effect on your job or your relationship with your company.

INSTRUCTIONS:

1. Do not place your name anywhere on your survey.

2. There are no right or wrong answers to these questions. Your honest opinion is what matters, so please be as frank as possible in your answers.

3. Please be careful not to skip pages when you turn pages.

4. Please try to answer every question. Some questions may look like others, but each one is different and important.

5. While we would very much like you to answer all of the questions, it is fine to leave a question blank if you do not feel comfortable answering it.

About Your Job

Please mark <u>one box</u> for each question.

1. How often do you have too many different things to do at work?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

2. How often does your job require you to work very fast?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

3. How often do you receive conflicting requests from two or more people?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

4. How often does your job require you to work very hard?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

5. How often do you feel pressure to do things that you think may not be best?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

6. How often do you do things that are apt to be accepted by one person and not accepted by others?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

7. How often is there a great deal to be done?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

8. How often do you have to do things on the job that are against your better judgment?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

9. How often does your job leave you with little time to get things done?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

10. How often do you have to bend or break a rule or policy in order to carry out an assignment?

- ❑ Never
- ❑ Rarely
- ❑ Sometimes
- ❑ Often
- ❑ Almost all the time

Now we would like you to indicate <u>to what extent</u> you do certain things at work.

1. To what extent does your job require a great deal of concentration?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

2. To what extent do you know exactly what is expected of you on your job?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

3. How much influence do you have over the <u>variety of tasks</u> you do at work?

- ❑ None
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

4. To what extent does your work need your undivided attention?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

5. In general, to what extent do employees experience very high levels of stress?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

6. How much influence do you have over the <u>order</u> in which you do tasks at work?

- ❑ None
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

7. To what extent do you have to keep your mind on your work at all times?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

8. To what extent are there clear, planned goals and objectives for your job?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

9. How much influence do you have over the <u>amount</u> of work you do?

- ❑ None
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

10. To what extent do you have to concentrate to watch for things going wrong?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

11. To what extent does the way things are run here cause employees unnecessary stress?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

12. How much influence do you have over the <u>pace</u> of your work, that is, how fast or slow you work?

- ❑ None
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

13. To what extent can you let your mind wander and still do your work?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

14. To what extent do you have a clear explanation about what has to be done on your job?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

15. To what extent can you do your work ahead and take a short rest break during work hours?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

16. To what extent do you have to react quickly to prevent problems?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

17. To what extent do some employees have to do more work than others?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

18. In general, how much influence do you have over how you do your work?

- ❑ None
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

19. To what extent do you have to keep track of more than one thing at a time?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

20. How often do you know what your job responsibilities are?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

21. To what extent does your job require you to remember many different things?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

Please answer the following questions about <u>your immediate supervisor</u> (boss).

1. To what extent does your immediate supervisor appreciate extra effort from employees?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

2. In general, to what extent does your immediate supervisor ignore employees' suggestions?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

3. To what extent does your immediate supervisor appreciate employees' hard work?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

4. To what extent does your immediate supervisor blame employees for things that are not their fault or are outside their control?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

5. **To what extent does your immediate supervisor praise employees for good work?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

6. **In general, to what extent does your immediate supervisor understand when an employee is absent due to a personal problem?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

7. **To what extent does your immediate supervisor notice if an employee does the best job possible?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

8. **In general, to what extent does your immediate supervisor care about employees' opinions?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

9. **In general, to what extent is your immediate supervisor available to help when an employee has a problem?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

10. **To what extent does your immediate supervisor yell at employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

11. **To what extent is your immediate supervisor concerned about employee well-being?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

12. **To what extent does your immediate supervisor care if employees are satisfied with their jobs?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

13. **To what extent does your immediate supervisor lie to employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

14. **To what extent does your immediate supervisor treat employees with respect?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

15. **To what extent does your immediate supervisor play favorites?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

16. **In general, to what extent does your immediate supervisor ignore employees' complaints?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

17. **To what extent does your immediate supervisor make unreasonable demands of employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

18. **If given the opportunity, to what extent would your immediate supervisor take advantage of employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

19. **When making important decisions, to what extent does your immediate supervisor disregard the consequences of these decisions on employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

20. **In general, to what extent is your immediate supervisor willing to help employees when they need a special favor?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

21. **To what extent does your immediate supervisor treat employees differently based on their race?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

22. **To what extent does your immediate supervisor care more about making a profit than about employee well-being?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

23. To what extent is your immediate supervisor concerned about paying employees what they deserve?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

24. To what extent does your immediate supervisor treat employees like children?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

Now, please answer the following questions about <u>upper management</u>.

1. To what extent does upper management appreciate extra effort from employees?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

2. In general, to what extent does upper management ignore employees' suggestions?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

3. To what extent does upper management appreciate employees' hard work?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

4. To what extent does upper management blame employees for things that are not their fault or are outside their control?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

5. To what extent does upper management praise employees for good work?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

6. In general, to what extent does upper management understand when an employee is absent due to a personal problem?

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

7. **To what extent does upper management notice if an employee does the best job possible?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

8. **In general, to what extent does upper management care about employees' opinions?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

9. **In general, to what extent is upper management available to help when an employee has a problem?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

10. **To what extent does upper management yell at employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

11. **To what extent is upper management concerned about employee well-being?**

- ❑ Not at all
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- ❑ A moderate amount
- ❑ Quite a bit
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12. **To what extent does upper management care if employees are satisfied with their jobs?**

- ❑ Not at all
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- ❑ A very great deal

13. **To what extent does upper management lie to employees?**

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- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

14. **To what extent does upper management treat employees with respect?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

15. **To what extent does upper management play favorites?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

16. **In general, to what extent does upper management ignore employees' complaints?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
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- ❑ A very great deal

17. **To what extent does upper management make unreasonable demands of employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

18. **If given the opportunity, to what extent would upper management take advantage of employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

19. **When making important decisions, to what extent does upper management disregard the consequences of these decisions on employees?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

20. **In general, to what extent is upper management willing to help employees when they need a special favor?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

21. **To what extent does upper management treat employees differently based on their race?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

22. **To what extent does upper management care more about making a profit than about employee well-being?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

23. **If the company earned a greater profit, to what extent would upper management consider increasing employee salaries?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

24. **To what extent is upper management concerned about paying employees what they deserve?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

25. **To what extent does upper management treat employees like children?**

- ❑ Not at all
- ❑ Just a little
- ❑ A moderate amount
- ❑ Quite a bit
- ❑ A very great deal

The following questions ask about your relationships with people at work. Think about your immediate supervisor (boss).

1. How much does your boss go out of his way to do things to make your work life easier for you?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

2. How easy is it to talk with your boss?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

3. How much can your boss be relied on when things get tough at work?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

4. How much is your boss willing to listen to your personal problems?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

How about other people at work?

1. How much do other people at work go out of their way to do things to make your work life easier for you?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

2. How easy is it to talk with other people at work?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

3. How much can other people at work be relied on when things get tough at work?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

4. How much are other people at work willing to listen to your personal problems?

- ❑ Not at all
- ❑ A little
- ❑ Somewhat
- ❑ Very much

Your Feelings about Your Job

1. Knowing what you know now, if you had to decide all over again whether to take the type of job you now have, what would you decide?

I would …

- ❑ Decide without hesitation to take the same type of job
- ❑ Have some second thoughts
- ❑ Decide definitely NOT to take the same type of job

2. If you were free right now to go into any job you wanted, what would your choice be?

I would …

- ❑ Take the same job
- ❑ Take a different job

3. If a friend of yours told you he was interested in working in a job like yours, what would you tell him?

I would …

- ❑ Strongly recommend it
- ❑ Have doubts about recommending it
- ❑ Advise against it

4. All in all, how satisfied would you say you are with your job?

- ❑ Very satisfied
- ❑ Somewhat satisfied
- ❑ Not too satisfied
- ❑ Not at all satisfied

Please indicate the likelihood of each of the following statements.

1. How likely is it that, if you want it, you can keep your job for the next year?

- ❑ Extremely likely
- ❑ Very likely
- ❑ Somewhat likely
- ❑ A little likely
- ❑ Not at all likely

2. If you lost your current job, how likely is it that you could find a comparable job elsewhere?

- ❑ Extremely likely
- ❑ Very likely
- ❑ Somewhat likely
- ❑ A little likely
- ❑ Not at all likely

3. If you lost your current job, how likely is it that you would be employed elsewhere within a short time?

- ❑ Extremely likely
- ❑ Very likely
- ❑ Somewhat likely
- ❑ A little likely
- ❑ Not at all likely

4. How likely is it that you will lose your job because of layoffs or downsizing during the next year?

- ❑ Extremely likely
- ❑ Very likely
- ❑ Somewhat likely
- ❑ A little likely
- ❑ Not at all likely

5. If your company went out of business, how likely is it that you would have to learn new skills to be employable?

- ❑ Extremely likely
- ❑ Very likely
- ❑ Somewhat likely
- ❑ A little likely
- ❑ Not at all likely

Think of your job in general. All in all, what is it like most of the time?

1. Demanding

- ❑ Yes
- ❑ No
- ❑ I can't decide

2. Pressured

- ❑ Yes
- ❑ No
- ❑ I can't decide

3. Hectic

- ❑ Yes
- ❑ No
- ❑ I can't decide

4. Calm

- ❑ Yes
- ❑ No
- ❑ I can't decide

5. Relaxed

- ❑ Yes
- ❑ No
- ❑ I can't decide

6. Many things stressful

- ❑ Yes
- ❑ No
- ❑ I can't decide

7. Pushed

- ❑ Yes
- ❑ No
- ❑ I can't decide

8. Irritating

- ❑ Yes
- ❑ No
- ❑ I can't decide

9. Under control

- ❑ Yes
- ❑ No
- ❑ I can't decide

10. Nerve-wracking

- ❑ Yes
- ❑ No
- ❑ I can't decide

11. Hassled

- ❑ Yes
- ❑ No
- ❑ I can't decide

12. Comfortable

- ❑ Yes
- ❑ No
- ❑ I can't decide

About Your Health and Well-Being

We would like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please mark a box for each question.

1. Over the past few weeks, have you been able to concentrate on whatever you're doing?

- ❑ Better than usual
- ❑ Same as usual
- ❑ Less than usual
- ❑ Much less than usual

2. Over the past few weeks, have you lost much sleep due to worry?

- ❑ Not at all
- ❑ No more than usual
- ❑ A little more than usual
- ❑ Much more than usual

3. Over the past few weeks, have you felt that you are playing a useful part in things?

- ❑ More so than usual
- ❑ Same as usual
- ❑ Less useful than usual
- ❑ Much less useful

4. Over the past few weeks, have you felt capable of making decisions about things?

- ❑ More so than usual
- ❑ Same as usual
- ❑ Less so than usual
- ❑ Much less capable

5. Over the past few weeks, have you felt constantly under strain?

- ❑ Not at all
- ❑ No more than usual
- ❑ A little more than usual
- ❑ Much more than usual

6. Over the past few weeks, have you felt you couldn't overcome your difficulties?

- ❑ Not at all
- ❑ No more than usual
- ❑ A little more than usual
- ❑ Much more than usual

7. Over the past few weeks, have you been able to enjoy your normal day-to-day activities?

- ❑ More so than usual
- ❑ Same as usual
- ❑ Less so than usual
- ❑ Much less than usual

8. Over the past few weeks, have you been able to face up to your problems?

- ❑ More so than usual
- ❑ Same as usual
- ❑ Less able than usual
- ❑ Much less able

9. Over the past few weeks, have you been feeling unhappy and depressed?

- ❑ Not at all
- ❑ No more than usual
- ❑ A little more than usual
- ❑ Much more than usual

10. Over the past few weeks, have you been losing your confidence in yourself?

- ❑ Not at all
- ❑ No more than usual
- ❑ A little more than usual
- ❑ Much more than usual

11. Over the past few weeks, have you been thinking of yourself as a worthless person?

- ❑ Not at all
- ❑ No more than usual
- ❑ A little more than usual
- ❑ Much more than usual

12. Over the past few weeks, have you been feeling reasonably happy, all things considered?

- ❑ More so than usual
- ❑ About same as usual
- ❑ Less so than usual
- ❑ Much less than usual

About Yourself

1. What is your birth date?

_____/_____/_____
Month Day Year

2. Are you male or female?

- ❑ Male
- ❑ Female

3. Do you currently smoke?

- ❑ No
- ❑ Yes

How many cigarettes do you smoke per day? (One pack = 20 cigarettes)

- ❑ 10 cigarettes or less
- ❑ 11 – 20
- ❑ 21 – 30
- ❑ 31 or more

4. What is the highest level of education you have completed?

- ❑ Less than a high school diploma
- ❑ High school diploma
- ❑ Some college or vocational training
- ❑ 2-year college degree
- ❑ 4-year college degree or higher

5. In <u>an average week</u>, how many hours do you work in your current job at [company name]?

_____hours

5. Which of the following best describes your present marital status?

- ❑ Never married, currently single
- ❑ Never married, currently have a partner
- ❑ Married
- ❑ Separated
- ❑ Divorced
- ❑ Widowed

6. How long have you worked with [company name]?

_____years and _____months

7. How long have you worked on this job?

_____years and _____months

8. How much are you paid per hour for the work you do at this company?

$_____per hour

9. With which of the following racial or ethnic backgrounds do you most strongly identify? Please mark one.

- ❑ Caucasian (White)
- ❑ African American
- ❑ Native American-
- ❑ Asian or Asian American
- ❑ Latino/a or Hispanic
- ❑ Other (specify: _____)

APPENDIX B
CONFIRMATORY FACTOR ANALYSIS RESULTS FOR MEASURES OF JOB STRESSORS, JOB CONTROL, SOCIAL SUPPORT, AND JOB SATISFACTION

Each measure in this study was analyzed using confirmatory factor analysis (CFA) to examine how well each item in a measure indicated the construct that the measure was supposed to measure. Initial CFA models were specified according to each measure's intended use. A good model fit was considered as reflecting the goodness of the items in the measure capturing the intended construct. If the initial model did not fit the data well, then the model was modified to explore a better fit. Tables B.1 to B6 show the results of the CFA, including regression weights and model fit indices.

The initial model of Job stressor measures did not fit the data well (Table B-1). Allowing cross loadings and eliminating a poorly performing item improved the model fit (Table B-2). For other measures, the initial model fit the data well, and no modification was made.

Construct	Item	Unstandardized Regression weight	S.E.	Standardized Regression weight	p	r^2
Workload	Your job requires you to work very hard	1.000			0.732	0.556
	Your job requires you to work very fast	0.914	0.087	<.001	0.691	0.499
	A great deal to be done	0.705	0.079	<.001	0.570	0.348
	Your job leaves you with little time to get things done	0.697	0.088	<.001	0.500	0.269
Role Conflict	Do things on the job that are against your better judgment	1.359	0.135	<.001	0.754	0.589
	Do things that are apt to be accepted by one person and not accepted by others	1.289	0.129	<.001	0.734	0.561
	Feel pressure to do things that you think may not be best	1.197	0.121	<.001	0.717	0.538
	Receive conflicting requests from two or more people	1.105	0.125	<.001	0.609	0.392
	Have to bend or break a role or policy to carry out an assignment	1.000			0.585	0.366
	Too many different things to do at work	0.752	0.115	<.001	0.418	0.196
Role Ambiguity	Have a clear explanation about what has to be done on your job (R)	1.054	0.111	<.001	0.660	0.454
	Know exactly what is expected of you on your job (R)	1.000			0.723	0.547
	Know your job responsibilities (R)	0.831	0.092	<.001	0.612	0.400
	Clear, planned goals and objectives for your job (R)	0.799	0.103	<.001	0.503	0.272
Mental Demands	Watch for things going wrong	1.248	0.156	<.001	0.583	0.357
	Your job requires a great deal of concentration	1.163	0.144	<.001	0.589	0.366
	Job require you to remember many different things	1.100	0.148	<.001	0.526	0.294
	Keep track of more than one thing at a time	1.048	0.146	<.001	0.505	0.272
	Your work need your undivided attention	1.000			0.580	0.361
	Keep your mind on your work at all times	0.978	0.126	<.001	0.553	0.330
	React quickly to prevent problems	0.974	0.147	<.001	0.456	0.224
	Let your mind worker and still do your work	-0.332	0.130	0.011	-0.174	0.051

Unstandardized regression weight on Method factor (constant) = .224 (p<.001)
Model fit indices: $\chi 2 = 504.620$, df = 181 , $p < .001$; CFI = .857; NNFI = .821; RMSEA = .065, 90%CI (.058, .072)

Table B.1: Initial CFA model for Stressor Measures (adapted from Hurrell & McLaney, 1988; Jackson et al., 1993). Due to poor model fit, the model was modified to the final model as shown in Table B.1.

Construct	Item	Unstandardized Regression weight	S.E.	Standardized Regression weight	P	r^2
Workload	Your job requires you to work very hard	1.000		0.728	<.001	0.620
	Your job requires you to work very fast	0.893	0.096	0.673	<.001	0.549
	A great deal to be done	0.606	0.079	0.489	<.001	0.348
	Too many different things to do at work (Cross loading on Role conflict)	0.350	0.091	0.265	<.001	0.265
Role Conflict	Do things that are apt to be accepted by one person and not accepted by others	1.000		0.692	<.001	0.580
	Do things on the job that are against your better judgment	0.994	0.087	0.680	<.001	0.561
	Feel pressure to do things that you think may not be best	0.880	0.079	0.650	<.001	0.536
	Receive conflicting requests from two or more people	0.835	0.087	0.563	<.001	0.411
	Your job leaves you with little time to get things done	0.786	0.090	0.510	<.001	0.349
	Have to bend or break a role or policy to carry out an assignment	0.746	0.082	0.531	<.001	0.388
	Too many different things to do at work (Cross loading on Workload)	0.311	0.095	0.211	0.001	0.265
Role Ambiguity	Know exactly what is expected of you on your job (R)	1.000		0.659	<.001	0.547
	Have a clear explanation about what has to be done on your job (R)	0.997	0.105	0.577	<.001	0.420
	Know your job responsibilities (R)	0.829	0.090	0.555	<.001	0.424
	Clear, planned goals and objectives for your job (R)	0.789	0.104	0.452	<.001	0.289
Divided Attention	Job require you to remember many different things	1.000		0.635	<.001	0.483
	Keep track of more than one thing at a time	0.898	0.123	0.575	<.001	0.413
Vigilance	Watch for things going wrong	1.000		0.527	<.001	0.353
	Your job requires a great deal of concentration	0.903	0.123	0.519	<.001	0.359
	Your work need your undivided attention	0.854	0.110	0.557	<.001	0.425
	Keep your mind on your work at all times	0.798	0.109	0.511	<.001	0.372
	React quickly to prevent problems	0.720	0.124	0.381	<.001	0.221

Unstandardized regression weight on Method factor (constant) = .332 (p<.001)
Model fit indices: $\chi 2 = 315.695$, df = 178 , $p < .001$; CFI = .935; NNFI = .913; RMSEA = .047, 90%CI (.039, .055)

Table B.2: Final CFA model for Stressor Measures (adapted from Hurrell & McLaney, 1988; Jackson et al., 1993)

		1	2	3	4	5
1	Workload	1.000				
2	Role conflict	0.482	1.000			
3	Role Ambiguity	-0.321	(n.s.)	1.000		
4	Divided Attention	0.303	0.145	-0.802	1.000	
5	Vigilance	0.236	-0.265	-0.882	0.559	1.000

Table B.3: Inter-factor correlation matrix for the stressor measures. Role conflict and role ambiguity did not have a significant correlation coefficient and thus the path was fixed to 0 in the final model.

Construct	Item	Unstd. Reg. weight	S.E.	Std. Reg. weight	P	r^2
Social Support	Can be relied on when things get tough at work	1.000		0.808	<.001	0.373
From coworkers	Willing to listening to your personal problems	0.889	0.086	0.643	<.001	0.213
	Go out of their way to make your work life easier	0.880	0.080	0.697	<.001	0.157
	Easy to talk to	0.676	0.071	0.579	<.001	0.148

Unstandardized regression weight on Method factor (constant) = .224 (p<.001)
Model fit indices: $\chi 2$ = .488, df = 2, p = .783; CFI = 1.000; NNFI = 1.022; RMSEA = .000, 90%CI (.000, .069)

Table B.4: Initial and final CFA model for the measure of Social Support from Coworkers (adapted from Hurrell & McLaney, 1988)

Construct	Item	Unstd. Reg. weight	S.E.	Std. Reg. weight	P	r^2
Job Control	Influence over the order in which you do tasks at work	1.000		0.730	<.001	0.533
	Influence over the pace of your work	0.938	0.119	0.708	<.001	0.501
	All in all, how much influence do you have over how you do your job	0.891	0.276	0.675	0.001	0.455
	Influence over the amount of work you do	0.832	0.111	0.568	<.001	0.328
	Influence over the variety of tasks	0.721	0.089	0.573	<.001	0.323
	Do your work ahead and take a short rest break during work hours	0.254	0.095	0.214	0.007	0.046

Unstandardized regression weight on Method factor (constant) = .224 (p<.001)
Model fit indices: $\chi 2 = 3.879$, df = 3 , p = .275; CFI = .998; NNFI = .986; RMSEA = .029, 90%CI (.000, .099)

Table B.5: Initial and final model for the Job control measure (adapted from Hurrell & McLaney, 1988).

Construct	Item	Unstd. Reg. weight	S.E.	Std. Reg. weight	P	r^2
Job satisfaction	Take the same job	1.374	0.124	0.638	<.001	0.407
	Recommend this job to a friend	1.183	0.088	0.791	<.001	0.626
	All in all, satisfied with my job	1.000		0.794	<.001	0.484
	Take the same type of job	1.095	0.090	0.696	<.001	0.630

Unstandardized regression weight on Method factor (constant) = .224 (p<.001)
Model fit indices: $\chi 2 = 2.346$, df = 2 , p = .309; CFI = .999; NNFI = .996; RMSEA = .022, 90%CI (.000, .111)

Table B.6: Initial and final model for the Job Satisfaction measure (adapted from Hurrell & McLaney, 1988).

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