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UMI
The association between workplace hierarchy, workplace psycho-social factors and quality of life among workers at a Canadian manufacturing plant

by

Desré Monique Kramer

A thesis submitted in conformity with the requirements for the degree of Master of Science
Graduate Department of Community Health
University of Toronto

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Abstract

The association between workplace hierarchy, workplace psycho-social factors and quality of life among workers at a Canadian manufacturing plant.

Master of Science, 1999.

Desré Monique Kramer.

Graduate Department of Community Health.

University of Toronto

This study examined the relationship between hierarchy in the workplace, stressful workplace conditions and quality of life. It was hypothesized that hourly shop-floor workers would suffer from relatively lower quality of life as compared to professionals, and that a substantial part of this association would be due to hourly workers experiencing more stress in the workplace.

Sixty-four employees from an Ontario automotive-parts manufacturing company participated in the study. The concept of job stress was based on three models (Karasek’s job strain model, Siegrist’s effort-reward imbalance model, and the yin/yang communications model).

The study found that employment grade level only predicted job strain, and not perceptions of fairness or effectiveness of communication. Although stressful working conditions, as defined by low control and high demand, perceptions of fairness, and good communication, were all good predictors of overall quality of life, job hierarchy was not.
This thesis is dedicated to my father, Norman Edinburg, who began taking me around factories across South Africa from the time I was three years of age. It was he who gave me my love for the smell, sounds, structures and “reality” of manufacturing.

It is because of his career that I have pursued my interest in work and health, and his love and support have been the cornerstone of who I am as a person.
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1. Introduction

Statement of the problem

The purpose of this study is to examine the relationship between hierarchy in the workplace, stressful workplace conditions and quality of life. The hypothesis that workplace stress can affect health and well-being is supported by a significant body of evidence in both the theoretical literature as well as empirical research.

Conditions of work potentially influence all aspects of one's quality of life. Meaningful work offers one a sense of belonging, a venue for purposeful activity, occasion for self expression, and the opportunity to achieve personal goals, hopes and aspirations. Work can provide experiences of creativity, mastery and a sense of purpose. On the other hand, work that is not satisfying, unsafe, unhealthy, stressful, oppressive, overly demanding, and which does not allow for freedom of thought, expression or decision-making may be a source of stress which may spillover to the rest of one’s life so that one’s health, and one’s relationship with society can be adversely affected.

The potential spillover between job stress and quality of life could be reflected in workers’ satisfaction with their work, their freedom from worry, and their productivity. When workers are in a supportive environment, an environment where their immediate superior is sympathetic and treats them with fairness, an environment which is safe and healthy, and where they feel that their efforts are recognized and rewarded, their health is often shown to be better, and it is thought that their overall quality of life and well-being is improved.

That such may be the case is suggested by research that finds that physical health is affected by complex interactions of a number of social determinants, one of the most important of which is the amount of control that a person feels they have in the workplace. It has also been proposed that a person who has a job that allows for active involvement and control is more politically and socially active in the community. It is also thought that the experience of a worthwhile worklife supports a more involved social life.

While much of the present research into workplace stress has focused on the physiological evidence linking job strain with physical health, the purpose of this study is to provide the link between job stress
and overall quality of life.

The following sections review key concepts and empirical literature related to the workplace environment and quality of life. It includes four models: the job strain model, the effort-reward imbalance model, the yin/yang communication model, and the spillover effect model, and the empirical literature that is associated with these models. A fifth model that links workplace conditions and quality of life provides the theoretical underpinnings to this study. This thesis’s Workplace-Quality of Life model predicts that employment grade levels will determine the experience of workplace stress and satisfaction, which will in turn affect perceptions of overall quality of life.
2. The Workplace Environment

The last two hundred years has seen the accumulation of a vast body of thought on the impact of stress in the industrialized workplace on the health and well-being of workers. This research has come from a number of very diverse theoretical and methodological perspectives. But it has only been in the last 40 years (with most of the research in the last decade), that workplace hierarchy, stress and health have been operationalized and become the focus of empirical research by social scientists.

Workplace hierarchy

The generalized conclusion of the research that has examined the effect of workplace hierarchy on workers, is that those who are more educated, higher-paid, and with higher employment grade levels have a better sense of health and well-being (Marmot, Smith, Stansfeld, et al., 1991). Susan MacIntyre gives an overview of the literature that has examined the data on the differences in health and well-being between members of different occupational classes, and has concluded that, "consistent gradients are observable for both men and women in mortality by occupational class" (MacIntyre, 1989, p. 393). Her overview shows that differences in health between occupational classes is quite pervasive, affecting any number of health and social outcomes.

She concludes that there is a greater risk of death for lower occupational classes from congenital anomalies, infectious and parasitic diseases, respiratory diseases, diseases of the digestive system, disease of the circulatory system, diseases of the blood and blood-forming organisms and most types of cancers. The height and weight of children varies systematically by class with the average height of both men and women in upper occupational classes consistently higher than their lower occupational class counterparts. Unskilled manual workers have more chronic illness and acute illness, more mental illness and lower states of well-being, higher levels of absenteeism, worse eye sight, significantly higher systolic and diastolic blood pressure, lower fertility, and their children have lower birth-weights.

As an example of the studies reviewed by MacIntyre, the Black Report (Townsend and Davidson, 1982), based in England and Wales, compared “structural/materialistic” and “cultural/behavioral” explanations.
of social class inequalities in health. This study lends support to the view that workers with lower employment grade levels are consistently less healthy than those with higher employment grade levels. This study found that death rates between the lowest class gradient and the highest vary 2.5 to 1.

Another highly quoted study that notes the correlation between occupational class and health and well-being is the Whitehall study (Marmot, Rose, Shipley & Hamilton, 1978). This longitudinal study used the British Registrar General's five-class job classification of civil servants as the basis for comparing a number of health outcomes. It used both self-reported and external assessments of job conditions to predict long and short spells of sick-leave among civil servants.

The study found that occupational level was a very strong determinant of health. One of the indicator measures collected, for example, was blood pressure — the study found a relationship between social class and blood pressure. It found that 11 percent of the administrators, 12 percent of the professional and executive, 14 percent of the clerical and 16 percent of the “other” grades had a systolic blood pressure of 160 mmHg or greater.

In this study, external assessments of psycho-social working conditions made by supervisors, and internal, self-reported assessments of the same conditions provided predictions of a similar magnitude, although the correlations between the two classes of assessments were relatively small. So it seems that although internal and external assessments are not strongly related to each other, each by themselves seems to predict health outcomes.

**Linking control and stress to health outcomes**

Many of the studies look to the possible cause for these health differences, and conclude that the implication of their research is that there is a control difference between the occupational classes and this leads to stress. One theory is that workplace stress (which can be seen as emotional distress, emotional exhaustion, feelings of conflict and ambiguity, anxiety and physical symptoms of poor health [Jackson, 1988]) could be the cause of ill-health.

For example, there are numerous studies and research that support the hypothesis that control, stress and health are correlated (Jackson, 1989).
There is compelling evidence that, in general, personal control (especially in the workplace environment) is associated with a number of personal health outcomes, and lack of control with various forms of ill health. This effect has been demonstrated in experimental animal research (Henry & Stephens, 1977) and in extensive empirical research in different workplaces around the world.

Jackson and Schuler (1985) have summarized a number of studies that make the link between control, stress and ill-health, and say that most of the studies have concluded that when workers are in an environment that is sympathetic to them participating in job-related decision making, their stress level is considerably lower. As a further example, Marianne Frankenhaeuser (1979, 1991) has used methodology from psychology, psycho-physiology and psycho-somatic medicine to support her thesis that machine-paced work can be dangerous to workers' health and well-being. She advocates the idea that this is because of a lack of control or variety in the work and the restriction of social interaction. Her research shows that there is both a lack of, and an excess of stimulation in technologically-determined workplaces. The workers' skills are constantly underutilized, yet the quantity of work is excessive.

The literature points to work-related psycho-social stressors that originate in the social structures of the workplace (what occupation you have and what your work environment encompasses), and how these stressors affect workers through psychological processes and influence health through different manifestations — cognitive, emotional, behavioral and physiological (Levi, 1994). Imbedded in this over-arching theory are mitigating factors which explain why some individuals react better or worse to stress (looking at variables such as social support in the workplace or at home, and psychological vigor and ability to adapt).

**Workplace hierarchy and stress**

How control is linked to employment grade level, and how a lack of control leads to stress, and hence to ill health can be seen from two perspectives. On the one hand, there is the potential role of control (autonomy, choice, participation, ability to exert influence, decision-making, power) in supporting health. Higher employment grade levels come with a greater ability to control one's work environment, and hence a greater ability to protect oneself from physical and psychological stress (Evans, et
The lower a worker’s employment grade level, the less influence or control workers have over the means, manner, and method of their work, and the higher their stress level.

Studies (summarized by Barrett, 1998) find that the lower a worker is in the hierarchy of the workplace, the more vulnerable workers are to micro-management of the smallest of their activities, and to being objects of surveillance and unnecessarily directive supervision. They are more likely to be recipients of unrealistic expectations and conflicting demands, and to being made to feel stupid, insignificant, incompetent, inefficient and redundant. They are more subject to time pressures (demands for over-time and shift work), to work overload, to physical dangers (from machinery, chemicals, heat and noise), sexual and racial discrimination, and harassment of all kinds. They are also usually not consulted when policies and rules are formulated, when jobs are designed, or when changes are made.

Shain (1996) provides a summary and political analysis of the findings in this field. His explanation for the link between occupational level, stress and health is that workers in the lower occupational grades, “[whether unionized or not] have very little say in the ordering of their own lives” (Shain, 1996, p.337). A commonly quoted comment from Blackburn and Mann (1979) notes that most employees have to use “more mental effort and resourcefulness in getting to work than in doing their jobs.” In the face of such constraints, individual orientations and preferences matter little, and concluding that many workers’ physical and mental health are affected by their work environment is not such a leap of faith.

Another factor connecting employment grade level with stress is job security (Siegrist, 1998). Workers within low occupational grades are more likely to be subject to employers unilaterally restructuring the workplace, changing the organization of their jobs, and imposing technological changes. More importantly, workers with higher status have greater flexibility in the labor market. It is easier to leave a non-conducive work environment and find alternative work if you are better educated and have more marketable skills.

But even potentially more significant, are the deeper structural forces that determine why white collar workers have less job stress than shop-floor blue-collar workers. This includes the “institutional disempowerment” that is so integral to the workforce that it is accepted, unquestioningly, as the “given” way workplaces should be organized. Shain
summarizes the research in this field, with his statement that institutional disempowerment is the “engine of workplace organizations, so deeply buried that its workings are frequently inaudible to the naked ear, yet so powerful that it influences our very consciousness of what it means to work and be employed in our society” (Shain, 1996, p. 335).

Shain goes on to say that this structural force is intrinsically imbedded in the legal framework upon which our labor relations is founded. It revolves around the concept of employer as “master” and employee as “servant”. Although not all employees would acknowledge that they feel like “servants” (there is obviously a gradient of control that follows the employment grade level), Shain’s analysis of this unwritten “labor law” says that most countries adhere to this “culprit in the defeat of employees’ mental and physical health” (the master-slave relationship), whether the labor law falls under Common Law or Civil Law jurisdictions, and whether the workplace is unionized or not.

The spillover from work to the community

Finally, research into the effects of the hierarchical workplace has not stopped at merely examining control, stress, and its health outcomes. Research also shows that the kind of control that your job allows you, will also affect how you interact with your community (Karasek, 1990), and how you feel about your life in general. This research has direct implications for this study which is looking at the broad implications of employment grade level on workplace conditions, and how stress and strain in the workplace can affect overall quality of life.
3. Models of Workplace Stress

It may very well be that work can be hazardous to one’s quality of life. In the past 20 years there has been an increasing interest in the impact of psycho-social aspects of workplace conditions on worker health and well-being. Absenteeism, job turnover, reduced productivity, chronic depressive disorder, indicators of coronary heart disease, and general symptoms or health complaints are just some of the problems that are thought to be the result of worker psychological overload. Companies have become increasingly motivated, not only by the need for cost containment, but also from humanitarian reasons to examine their workplace environments (Brooker, et. al., 1998).

Since the objective of this research is to examine the inter-relationship and correlation of two substantive areas of study: stressful workplace conditions and overall quality of life, it is necessary to examine a number of theoretical conceptualizations within these fields. To this end, three theoretical models will be examined in detail: Karasek’s job strain/control-demand model (1979), the Siegrist’s effort-reward imbalance “Fairness” model (1996), and the Yin/Yang communication model (Kramer, 1997).

3.1 Job Strain Model

Since the 1980s, Karasek and Theorell’s model of job strain (Karasek & Thorell, 1979, 1990), has been very prominent. This model offers an explanation for the relationship between psycho-social characteristics of the workplace, stress, and a range of negative health and well-being outcomes from cardiovascular disease to political and community inactivity.

The Karasek-Theorell model says that under-utilization of abilities, lack of job discretion and decision latitude, excess of demand within the work structure, lack of job support, as well as high constraints imposed upon workers will affect the amount of stress felt by workers. Stress has been shown to have acute effects on the cardiovascular system that is mediated by the sympathetic adrenal medullary release of catecholamines and subsequent increase in heart rate and ambulatory blood pressure during the working day (Johnson, et al., 1996).

The Karasek and Theorell’s model, variously called the Job Strain
model or the job control/demand model, draws together two traditions. The first, the “life stress” tradition, focuses on mental and physical illness induced by “stressors” on the job; these job demands include work load, deadlines or conflicts (Caplan, Cobb, French, Van Harrison & Pinneau, 1975). The second substantive area includes studies of job satisfaction, focusing on job decision latitude. Their model draws together these two traditions and focuses on the psychological and social structure of the work situation — issues relevant to work demand, decision-making opportunities, and social interaction.

The demand-control model postulates that psychological and physical strain (low well-being), and the concurrent risk to physical and mental health, results from an interaction stress effect from two sources. The model says that the joint effect (interaction) of high psychological demands or pressures, combined with low control or decision latitude in meeting those demands, is what causes stress or “job strain” in the workplace.

“Job strain” is defined by Karasek (1990) as the psychological strain (fatigue, anxiety, depression, and physical illness) that occurs when the “psychological demands” of the job are high, and the worker’s “control” over objective task characteristics is low. “Psychological Demand” is defined as, “psychological stressors involved in accomplishing the work load” (p. 291). “Control”, which is operationalized in terms of decision latitude (skill discretion and decision authority), is defined as “the working individual’s potential control over his [sic] tasks and his conduct during the working day” (1979, pp. 289-290).

“Control”, in the multiplicity of studies that have used the control/demand job strain model, has been variously interpreted to mean, “(1) control as an objective characteristic of the work situation, reflecting the extent to which the design of work tasks . . . allows opportunities for control; (2) control as a subjective evaluation reflecting an individual’s judgment about the extent to which his or her work situation is amenable to control; and (3) control as a generalized belief on the part of an individual about the extent to which important outcomes . . . are controllable” (Parkes, 1989, p. 21).
The model (Karasek, 1989a) forms a two-by-two matrix with **psychological demands** as one major dimension (includes concepts of work load and work pace), and **decision latitude (control)** (includes concepts of decision authority, skill discretion), as the other.

**Psychological demand/decision latitude model**

![Diagram of the Psychological demand/decision latitude model]

**Figure 1. The Job Strain model**


The model allows one to distinguish between four main types of jobs: “high strain” jobs (high demands and low decision latitude), “low strain” jobs, sometimes called “relaxed” jobs (low demands and high decision latitude), “active” jobs (high demands and high decision latitude), and “passive” jobs (low demands and low decision latitude).

Integral to the model is also a **learning and motivational diagonal** that goes from “passive” to “active” jobs, and a **strain diagonal** that goes from low to high strain. The high- to low-strain diagonal has been focused on when workplace conditions have been correlated to health effects. Karasek’s main hypothesis is that the lowest levels of psychological well-
being and the highest levels of disease symptoms and negative signs of well-being will be found in the high strain group (Kristensen, 1995). Karasek’s reasoning is that lack of control over how to meet the job’s demands and how one can use one’s skills, defines a state of arousal that inhibits learning; strain-induced inhibition of learning, in turn, further increases arousal by impairing confidence and self esteem (Karasek & Theorell, 1990).

The learning/motivational diagonal represents the polarization of work into stimulating and interesting work (“active” jobs) for one group of workers, and monotonous work (“passive” jobs) for another group. Karasek says that people who have active jobs, have active leisure. They are active in the community and in labour, and active politically. Those who have passive jobs do not get politically involved or involved with their community. He uses the theory of learned-helplessness to explain why people holding passive jobs generalize their behavior to the rest of their lives.

One of Karasek’s fundamental ideas is that control and demand differ depending on job content (title/occupation/employment grade level). Using a data base of 4,503 respondents derived from a combined sample of individuals surveyed for the U.S. Department of Labor’s Quality of Employment Surveys in 1969, 1972, and 1977, and job classifications from the U.S. Census occupational codes, Karasek worked with 200 job categories. The study found a significant difference between occupations on dimensions of decision latitude and psychological demands, and that high demand/low control is a powerful predictor of the risk of cardiovascular illness in blue-collar workers.

Karasek has subsequently mapped the 200 job categories into his four quadrant model. For example, machine paced operatives (assembler, cutting operative, inspector, freight handler) and service workers have high strain jobs, and professionals and supervisors have active jobs. With subsequent research, he has also broadened the outcomes of “high strain” work to not only include cardiovascular illness, but also such diverse outcomes as musculoskeletal disorders, diabetes, cancer, psychiatric illness, gastro-intestinal illness, occupational and traffic accidents, suicides, total mortality, alcohol-related diseases, sleeping problems, depression, reproductive problems, anxiety, work satisfaction — as well as quality of life (Kristensen, 1995).
This study is using the Karasek model as a fundamental tool for gaining information on workers' perceptions of control and demand in the workplace. Significant for this research, is that the model has been used to examine stress and job strain with any number of psycho-social outcomes, so using it to examine quality of life can be seen as an expansion of previous research.

Secondly, using Karasek's model allows this study to postulate that employment grade levels can be the causal link between stress in the workplace and quality of life. Karasek's active/passive diagonal also allows this study to link to the larger theoretical literature on alienation, power, and inequalities in the workplace (e.g. Blauner, 1964; Braverman, 1974; Seeman, 1967; Johnson & Johansson, 1991), and to make some theoretical predictions that people who have more active jobs in the workplace, will express higher satisfaction ratings with their community involvement.

3.2 The Effort-Reward Imbalance Model

The Siegrist Effort-Reward Imbalance model (Siegrist, 1996) is a recently developed job stress model that attempts to make a theoretical link between the psychological, sociological and biological levels of analysis. It says that information from all three levels is needed. The model includes sociological information describing the work environment, psychological information describing personal characteristics (skills, coping practices), and biological information describing the immediate or long-term health consequences. It builds on French, Caplan & Harrison's (1982) person-environment fit model that emphasizes the need for an interplay between objective and subjective components both of the work environment and of the person in the role of work in human life.

The model was designed as a specific response to perceived inadequacies in the Karasek Job Strain model. Yet the Siegrist model can also be seen as an expansion of the Karasek Job Strain model. First, the model incorporates a way to explain individual modes of coping with limited control. Secondly, there is a change in focus from specific job task characteristics to a focus on the perception and appraisal of adverse work conditions. The new model also includes information on job insecurity (macro-level decision latitude) which expands on the job strain model's concept of low job control.

The effort-reward imbalance model, as its name suggests,
postulates that adverse health effects can result from stress incurred when there is an incongruence between high demands and obligations in the workplace and the available rewards. A more colloquial way of perceiving the model is to see it as getting to a perception of “fairness” in the workplace. The model predicts that when there is a lack of balance between the amount of effort expended at work and the societal rewards of money, esteem and occupational status, individuals will experience a violation of their core expectations about reciprocity. The result should be emotional distress with autonomic arousal and associated strain reactions.

Siegrist explains how chronically stressful experiences can lead to ill health by looking to the mediating effect of biological processes. He says that:

“over time, recurrent autonomic activation following the experience of effort-reward imbalance at work is expected to tax the cardiovascular and hormonal systems. As a consequence of long-term taxing, cardiovascular and hormonal reactions to acute challenges may be compromised (i.e. reduced rather than elevated maximal responsiveness is expected to occur). Reduced responsiveness may be modulated peripherally (e.g. via regulation of beta receptors) or centrally at control sites within the brain” (Siegrist, 1996, p.35).

The model has two major domains: the Effort domain and the Reward domain. The Effort domain is divided into Intrinsic and Extrinsic Effort. Extrinsic Effort, as defined by high workload, looks at structural workplace pressures. This construct can be seen as similar to Karasek’s Psychological Demand domain. Intrinsic Effort focuses on the motivation of the individual worker in a demanding situation. It places an explicit emphasis on “personal characteristics that influence the perception of and the search for control” (Siegrist, 1996, p. 29). This is a psychological concept that looks at individual attributes such as a person’s ability to cope, their “need for control”, hostility and competitiveness.

Siegrist believes that individuals that score high on measures of need for control, “often tend to misjudge (i.e., overestimate or underestimate) demanding stimuli in their personal perception. It seems that both types of misjudgment are instrumental in eliciting excessive efforts and in providing opportunities to experience approval, success and dominance. . . . High levels of need for control in the long run may
precipitate states of exhaustion and physiological breakdown" (Siegrist, 1996, p. 19). This construct can be linked to the Karasek Control domain, especially as there is some conjecture that low control in the workplace can spill-back into high hostility (Bosma, et al, 1997).

The Reward domain is divided into three occupational career characteristics: money, esteem (or approval), and occupational status control. The esteem variable includes the concept of social support and has been linked to a relatively newly-added dimension of the Karasek model of social support (which this study does not include). The occupational status control variable looks at people's perception of their promotional opportunities and their sense of job security. The status control variable allows for labor market variables to be introduced into the model. Empirical research based on this model has used objective measure as well as self-reported measures when assessing job opportunities and job security.

![Diagram of the effort-reward imbalance model](image)

**Figure 2. The effort-reward imbalance model**


This study has included the Siegrist effort-reward imbalance model in order to examine how self-perceptions of “fairness” influence a worker’s sense of stress in the workplace and how this may affect their perception of quality of life. It was felt that the Siegrist model’s fairness concept may enhance the Karasek’s model allowing for an even more accurate perception of stress in the workplace.
3.3 Yin/Yang Communication Workplace Model

A significant body of research since the 1970s has been examining job satisfaction in an attempt to examine whether people are working as hard as they used to, and whether productivity is less than it should be (Burnstein, et al., 1975). Worker motivation has been examined, worker commitment and conscientiousness has been questioned, and work/leisure trade-offs have been debated.

Very few hard and fast conclusions have been reached beyond the idea that worker satisfaction is a generalized term that encompasses some personal benefits such as enjoyment, respect, and self-fulfillment. There is a firm ideological conviction that the root cause of labour market problems (absenteeism, labour turnover, strikes, lack of commitment, premature retirement, quality of work) lies in job dissatisfaction, but this has not necessarily been proved empirically. A review of 31 studies indicates a slight but systematic positive relationship between satisfaction and performance, but there is nothing to indicate that increasing satisfaction will cause productivity to rise (Thurman, 1977).

On the other hand, there are strong research findings that job dissatisfaction is often connected with health problems and dissatisfaction with life in general (Seashore, 1973). A number of factors have been identified as important determinants of job satisfaction: income (job security and fairness in relation to co-workers), a safe and healthy environment, whether the work is interesting and allows for control over decision-making, conducive supervision, good relations with work colleagues, the opportunity to advance, and the extent to which a job contributes to a person's social status, self-esteem, and allows for social mobility.

More recent management theories within the organizational behavior literature have identified the issue of the concentration of control and power as a determining factor in workplace well-being (Deming, 1988; Trist, 1973; Peters, 1985; Senge, 1990; Morgan, 1986; Covey, 1990; Barrett, 1997; Rifkin, 1995; Moss-Kanter, 1995.) These “new management” theorists have supported the idea that there needs to be a sharing of recognition and power, and advocate a dispersal of decision-making. They encourage free-flowing communication (using the new information technology) throughout the organization (Kramer, 1997).

Organizational Behavior theorists advocate a balance between both
"hard" (structural and policy) and "soft" (cultural) determinants of workplace health. The Yin/Yang Communication Workplace model (Kramer, 1997) focuses on the continual flux and dynamic flow between these hard and soft determinants of workplace job satisfaction. This model advocates that there needs to be both aspects — cultural and structural aspects — "enmeshed" in a harmonious and dynamic balance. Integral to this model, and acting as the link between the hard and the soft management components, is both top-down, as well as bottom-up, communication.

The "hard" structural determinants of workplace health could include reducing job pace, instituting job enlargement and redesign, implementing reduced work hours, making the work site safe from mechanical risks and chemical toxins, increasing pay, reducing over time, improving benefit packages, increasing employee ownership and enhancing job security. The "soft" cultural determinants include management’s commitment to involving workers in decision-making, problem-solving and priority setting, allowing workers greater control over psychological demands, and encouraging on-going learning. Both soft and hard determinants of a healthy workplace are conditional upon efficient and effective communication.

Building upon the theoretical conceptualization of this communication-in-the-workplace model, this study asks questions about communication in this specific work site. It seeks to obtain information on workers’ perceptions of the efficiency of internal communication, the efficacy of feedback from management, and the effectiveness of leadership. This study incorporates an awareness that every workplace has its own individual culture, which can contribute to both stress in the workplace and individual perceptions of quality of life (Senge, 1996). An insight into the corporate culture offers the opportunity for an analysis which can act as a link between the micro-level self-perceptions and the more sociological/macro analysis of the structural hierarchical nature of the workforce as reflected in employment grade levels.
Figure 3. The yin/yang communication model.
Workplace conditions are formed by a dynamic interaction between hard structural forces, and more culturally-defined communication "soft" aspects. Note. From Eight case studies on health and safety systems within the industrial environment by D. Kramer, 1997b, submitted to the Faculty of Environmental Studies (York University) for the degree of Masters of Environmental Studies.
4. Empirical Research on Workplace Stress

This section reviews the empirical literature on the job strain model, the effort-reward imbalance model and one major research project that has examined how these models can be used together to analyze stress in the workplace.

4.1 Job Strain

The Job Strain model, and Karasek’s Job Content Questionnaire that was developed from the model, has been primarily used to study the interaction effect of psychological demands and control in the workplace and how this interaction can lead to stress and affect health and well-being.

The initial studies using the model were done by Theorell and Floderus-Myrrhed (1977) and Karasek et al. (1981). The 1977 study used the Job Content Questionnaire to analyze data from over 5,000 Swedish building construction workers and related them to information from various health registers maintained in Sweden. The results indicated that reports of high levels of perceived workload were associated with an increased age-adjusted risk of myocardial infarction. Karasek (1981) found that among Swedish male workers reports of high job demands were associated both with the development of signs and symptoms of cardiac heart disease and with increased risk of cardiovascular or cerebro-vascular death over the ensuing six years.

Presently, the largest studies using the model and versions of the questionnaire include an on-going U.S. national follow-up study of the 4,000 offspring of the original Framingham heart study of U.S. National Heart Lung and Blood Institute (Karasek, 1995), and a sample group of 4,500 based on the U.S. Department of Labour’s National Quality of Employment Survey of 1969, 1972, and 1977. There is also another ongoing study examining cardiovascular illness and absenteeism that includes 65,000 participants in six European countries (Theorell and Karasek, 1996).

Over the past two decades, the Job Content questionnaire has also been tested extensively across the United States, several countries in Europe, and in Japan (Kawakami, et al., 1995). It has been translated into ten languages and is presently being used by over 200 research groups.
This growing body of research has led to strong support for both the model and the Job Content questionnaire.

There are now summaries of the ways the model has been used to demonstrate the link between demand and control and coronary heart disease risk (Kasl, 1989; Schnall and Landsbergis, 1994; Kristensen, 1995; Johnson, Stewart, Hall, Fredlund and Theorell, 1996). Perrewe and Ganster (1989) similarly examined satisfaction, anxiety, pulse rate, and skin temperature as outcomes. These summaries also reflect the growing body of research looking at how high demand and low control is associated with psycho-social outcomes such as employee exhaustion, depression, job satisfaction and life satisfaction (Theorell, et al., 1998). Most of these studies have supported the idea of generalizing the model to more psycho-social outcomes, and support the concept that Job Strain is associated with negative health and well-being outcomes.

Studies that do not fully support the Job Strain model

But despite the strong weight in support of the Job Strain model, some research findings have been contradictory. Some of the contradictory studies have found either no association between Job Strain and adverse health outcomes, or the directionality of the association was contrary to that hypothesized. But these findings are more unusual.

The research that does seems to be gaining in importance is a growing number of studies that have found no evidence for a synergistic interaction between control and demand, and have found that the control domain by itself seems to be a much stronger predictor of health and negative psycho-social outcomes than the psychological demand domain (Warr, 1990). A review of 25 studies by Schnall, Landsbergis, and Baker (1994) has found that 17 of these studies found significant associations between Control and cardiovascular outcomes, whereas only 8 of 23 studies found significant associations with Psychological Demands. One of these studies is research on the original Framingham Heart, Lung and Blood Institute Study (LaCroix and Haynes, 1987) that showed that there was no interaction effect between control and demand among men, but interestingly, there was among women. As already-mentioned, Karasek is in process of updating this study (Karasek, 1995).

Critics have also noted that since most of the research has been time limited and based on self-reported questionnaires (or by occupational
representative scores derived from national samples that have been attributed to subjects in a secondary data set), it has been restricted to examining acute exposure reflecting only the job held at the time of the interview.

A recent study by Johnson et al. (1996) has tried to respond to the criticisms on methodology. This study was designed to address the effect of long-term and cumulative exposure to psycho-social work characteristics on prospective cardiovascular disease mortality risk, but its results also do not totally fit the Job Strain model. The study group, consisting of 12,517 currently or previously employed Swedish men 25 to 74 years of age, was taken from a random sample of the entire Swedish population obtained by Statistics Sweden from the National Registry of Births. The study was based on four annual samples (1977, 1979, 1980, 1981), involving 14 years of follow-up for cardiovascular disease mortality. Occupational histories were obtained for each subject by personal interviews. Psycho-social and physical exposure scores were assigned by linking each subject's occupational history with a work organization exposure matrix. The matrix was used to assign scores for work control, psychological job demands, social support, physical demands, and job hazards to each year of the subject's career.

The study found statistically significant differences in health outcomes related to the Control and Demand variables. As predicted, the study found strong evidence supporting the hypothesis that men exposed to lower control in their jobs have a substantial and statistically significant elevated risk for cardiovascular disease. The study introduced occupational class and educational levels as co-variates in all their logistical models to ensure that this association was not due merely to social class. Worthy of note is that although statistically significant associations were found for Psychological Demands, the association was in the opposite direction to that predicted by the model: higher levels of psychological job demands were found to be inversely associated with cardiovascular disease risk. The highest level of psychological job demands was found to involve the lowest level of cardiovascular disease mortality risk. Also interesting, is that the study found no significant associations between work social support, physical job demands, job hazards, and cardiovascular disease mortality.

Another recent large study, also focusing more on job control and less on the interaction of control and demand (job strain), has linked low decision latitude (control) to increased risk of a first myocardial infarction (Theorell, et al., 1998). This study worked from the presumption that since
the average level of job decision latitude over one's career is associated with myocardial infarction risk, it would be worth examining whether negative changes in decision latitude during the more recent years could be regarded as a separate risk factor.

The 1998 study obtained information from 1047 patients (809 non-fatal cases and 236 fatal cases) who had experienced one myocardial infarction. Self-reported data regarding control and psychological demands were obtained from a Swedish version of the Karasek Job Content questionnaire. The study also used the same work organization exposure matrix that Johnson et al. (1996) used for every year of paid work in the subject’s life. The degree of change in decision latitude was calculated as the change in inferred decision latitude from the 10th year preceding the event. Change was operationalized to be constant change in work hours, frequent overtime work, or a substantial portion of working hours scheduled at night.

The 1998 study concluded that both negative change in inferred-decision-latitude and self-reported job strain are important risk indicators in men under the age of 55 years, and particularly in blue-collar workers, even after adjustment for social class and other job factors of potential importance. Theorell et al. conjecture that a decline in social status may have a lot to do with the particular vulnerability of men between the ages of 45 to 54 who would perceive any drop in decision latitude as particularly threatening. They surmise that there is lowered expectation after 55 that decision latitude will increase, so a drop in social status would probably not be as important to this age group.

Findings from the above three studies as well as the accumulating body of empirical research finding that the Control domain is more important as a predictor than the Psychological Demand domain, suggest that this study should consider the two domains as separate variables apart from the Job Strain interaction variable. The theorizing from the 1998 Theorell et al. study can also be seen as a link to the Siegrist effort-reward imbalance model and research, where social status is considered a vital dimension of the Reward domain of the model. It supports this study's use of both models in its quest to get an overall assessment of workplace stress and its affect on quality of life.
4.2 Effort-Reward Imbalance

Less empirical research has been done on the Siegrist effort-reward imbalance model (see page 14) than on the Karasek job strain model (see page 10), but the body of research is growing in size. Siegrist’s empirical research has been done with blue-collar workers in Germany. His research was based on a 6.5 year prospective study of a cohort of 416 male blue-collar workers (ages 25-55) looking at psycho-social measures and major coronary risk factors (Siegrist, Peter, Junge, et al., 1990; Siegrist, Peter, Motz, et al., 1992). Medical and psycho-social data was collected at entry and three times during follow-up. A second research project with a sample of male middle-aged managers (n = 189; ages 40-55) in a car-producing company in Germany, using the same model and measures of hypertension, elevated fibrinogen, elevated atherogenic lipids and smoking, corroborated the results found in the research on the blue-collar workers (Peter, Siegrist, Stork, et al., 1991; Peter et al., 1995; Peter & Siegrist, 1997).

For both research studies, baseline epidemiological and clinical measures were used to explain prevalence and change over time in major coronary risk factors and to predict new clinical symptoms. Psycho-physiological information was derived from a standardized psychometric stress test. In both studies, Siegrist found that although the crucial predicting variables differed to some extent from analysis to analysis, it was always the combination of at least one indicator of high effort and at least one indicator of low reward that produced the observed negative health outcome (hypertension, atherogenic lipids).

These two studies found that poor promotion prospects and job insecurity (low rewards) among men with high workload and a high need for control (high efforts) was a predictor of new cardiovascular disease. Competitive, hostile, and over committed subjects, experiencing poor promotional prospects and blocked careers, are at the highest risk for subsequent heart disease. Specifically, Siegrist found in the blue-collar study that the threat to status control produced the highest intensity of stressful experience, but in the middle managers study, where the subjects had relatively higher status control than the blue-collar workers, all three reward components (status control, esteem and money) were equally strong as predictors of ill health.

Siegrist has also conducted a number of five-year prospective studies. One is with a cohort of 1,100 Chinese industrial workers in the city
of Wuhan (Siegrist, Bernhard, Feng, et al., 1990). This study used existing contextual and descriptive information, and the results mostly supported his model. He writes:

"this study revealed an interesting finding in terms of high-effort/low-reward conditions: systolic blood pressure and serum cholesterol significantly increased during the five years in the subgroup of workers who were recently allowed to extend their working hours and were paid overtime and productivity bonuses. This augmented pressure at work was associated with an increase in job insecurity and uncertainty about further promotion prospects" (Siegrist, 1996, p. 33).

The second large five-year prospective study is in process (Cremer et al., 1991). Some 4,000 industrial workers in Germany are being followed, and Siegrist reports that preliminary results are demonstrating an independent effect of high intrinsic effort at work (as measured by a shorter version of the “need for control” scale) on incidence of coronary events. A third study is looking at associations of effort-reward imbalance at work and reported symptoms in different groups of male and female public transport workers (Peter, R., Geissler, H. & Siegrist, J, 1998). Over 1300 employees participated in this study. They have found that medical symptoms usually associated with stress (like gastro-intestinal symptoms) are observed when personnel suffer from effort-reward imbalance. Siegrist concludes:

"In view of the long-term costs and reduced quality of life associated with high rates of reported symptoms, these results call for improved worksite health promotion in specific target groups of public transport workers.”

These findings lend support to the idea that in order to gain a more complete view of stressful conditions at work, it is necessary to take into account both workers’ personal need for control, as well as workers’ perceptions of how fairly they are treated in the workplace. That is why this study is augmenting the Job Strain model with the Siegrist model.
4.3 Job Strain and Effort-Reward

Much of the research in the substantive area of job stress and psycho-social conditions can be seen as using selected parts of the Karasek control-demand and the Siegrist effort-reward imbalance models. Variables such as participation, uncertain job future, supportive foreman and coworkers, ease of communication, promotion, and work setting are often all put together in one study, coming up with one dominant factor such as “job dissatisfaction”.

A typical piece of research of this sort was conducted by Matthews, Cottington, Talbott, Kuller and Siegel (1987). They investigated occupational hazards associated with hypertension (elevated blood pressure) among 366 blue-collar workers at two factories whose education level and nature of work was similar. These workers were selected because they had been exposed to different levels of noise on the job for a minimum of 10 years (a condition considered very stressful). An added factor was that some of the participants reported experiencing high levels of dissatisfaction and stress, e.g. an uncertain employment future and non-supportive coworkers — considered to be stressful work conditions over-and-above the noise stress.

Participants were given extensive physical examinations, completed two psycho-social inventories, and were involved in an experiment designed to test their ability to perform and to tolerate frustration during noise exposure. The researchers looked at a number of variables in the Karasek job strain model and the Siegrist effort-reward imbalance model, coming up with an overall job satisfaction rating.

As hypothesized, the more negative the perceptions of work conditions, the higher the diastolic blood pressure. These effects remained after controlling for age, body mass index, alcohol consumption, cigarette smoking habits, family history of hypertension, and severe noise-induced hearing loss. Elevated diastolic pressure was also associated with little opportunity for promotion and for participating in decision making at work, an uncertain job future, non-supportive co-workers and foreman, and difficulties in communication with others.
Another recent and significant study has attempted to specifically examine the overlap between the Karasek Job Strain and the Siegrist Effort-Reward Imbalance models. Since this is the first research looking into how the two models interact with health outcomes and employment grade level, a more detailed description follows.

Bosma, Peter, Siegrist and Marmot, (1998), re-examined data gathered as part of the Whitehall II study in light of the two models. The Whitehall II study (a follow-up study to Whitehall I) is a three-phase longitudinal study (from 1985 to 1993), of a cohort of 10,308 male and female civil servants to investigate the link between social gradient on ill health, specifically coronary heart disease. It examined work characteristics and social support within 20 London-based civil service departments.

In order to examine the Effort-Reward Imbalance model, the Bosma study re-examined phase I data. High Intrinsic Effort (a personal characteristic of a high need for control) was assessed using a Framingham type A questionnaire and the Cook-Medley hostility questionnaire. These two instruments measured characteristics such as competitiveness, latent hostility, a high need for approval, and an excessive work commitment. The Reward domain was examined by objective measures of occupational status control (specifically poor promotional prospects and restricted occupational mobility). This gave a measurement of lower-than-expected current employment grade levels. There was no measurement of the other two aspects of the Reward domain: job insecurity and financial reward. The Karasek Job Strain model was examined using the Job Content questionnaire focusing on high job demands, low job control, and low work support. There was also a measure used in 18 of the 20 departments where managers were asked for information on job pace and the level of control.

When looking at the Siegrist data, the study found that subjects who experienced a mismatch between their personal characteristics and characteristics of their occupational career had strongly elevated risks of subsequent coronary heart disease. It also found that men and women in lower employment grade levels reported effort-reward imbalance more often than subjects in higher grades. The Karasek data showed that low job control increased the risk of coronary heart disease, but the Job Strain (the interaction of Control and Demand) was not a predictor. The study did find, however, that the highest prevalence of job strain was found among the highest employment grade levels, due to a strong association between high job control, high psychological job demands and high employment grade
The study found that integrating control-related personal attributes and occupational career (status control) from the Siegrist model, with actual control over environmental factors such as daily tasks (Karasek’s job control), lent further insight into workplace conditions. A comparison between the two models demonstrated that subjects experiencing high effort and low reward conditions, and subjects with low job control had higher risks of new coronary heart disease than their counterparts.

These findings support the idea that combining the two theories further refines job stress theory. This present thesis also combines the two models and will be building on the Bosma et al. results.
4.4 Implications for this study

The three different models of workplace stress, and the empirical research on job strain, effort-reward imbalance and communication in the workplace, are being integrated as a whole in this study in order to obtain a holistic overview of workplace conditions and how they affect overall quality of life.

This study is one of the first Canadian applications of the Karasek Job Strain model, and its Job Content Questionnaire. Its use of the relatively new model of job stress, the Effort-Reward Imbalance model, and measuring it with a scale, called the “Fairness scale”, that has not been used before, is considered significant. This study's use of the new model of effective workplace communication, the Yin/Yang Communication Workplace Model, and a scale that measures communication that has mostly been used in the private sector, is also worth noting.

This study has created a new model out of the above four models that links them together, and examines how employment grade level could be the linking variable between workplace conditions and overall quality of life. The models lend support to this study's use of employment grade levels as a variable. The existing empirical research associated with the models demonstrates that employment grade level seems to be a significant variable in the workplace environment.

Finally, to measure the spillover effect of workplace conditions on overall well-being, the study uses a relatively new model of well-being, the Quality of Life profile. This study is the first application of this model and its scale, to the workplace environment. The next section examines the Quality of Life Profile chosen by this study.
5. Quality of Life

As discussed earlier, an important part of this study is looking at workplace conditions as they affect other areas of well-being. In the last decade, the broader conceptualization of health as advocated by the World Health Organization's Ottawa Charter for Health Promotion (WHO, 1986) has led to an increasing emphasis in the Social Sciences to examine health through the organizing principle of "quality of life".

There are a number of ways of conceptualizing and defining quality of life (Raphael, Renwick, Brown & Rootman, 1996) from the societal to the community-level and individual perspective. Quality of life has been applied to wellness and health, the impact of illness, availability of financial resources, work life and leisure, life roles, culture, community concerns and community integration (Raphael, Brown, Renwick and Rootman, 1997). But most definitions of quality of life include both the broader determinants and the end-products of health. For example, Bowling (1991) says quality of life represents individual responses to the physical, mental, and social effects of illness on daily living which influence the extent to which personal satisfaction with life circumstances can be achieved. Lindstrom (1992) says that quality of life is the total existence of an individual, a group, or a society.

This chapter reviews one newly conceptualized quality of life model, the Centre for Health Promotion Quality of Life model, developed at the University of Toronto, and the empirical research that has used this particular model. This model of quality of life defines quality of life as the degree to which a person enjoys the important possibilities of his/her life (Raphael et al., 1996). Following the WHO's positive conceptualization of health as a resource for daily living (WHO, 1986), the model builds upon a focus on health rather than illness, emphasizes social and personal resources as well as physical capacities.

This model of quality of life takes a holistic approach to conceiving and measuring quality of life, taking a multidimensional view to as many interrelated aspects of a person's life as possible. The broad conceptualization of this model says quality of life includes the physical, psychological, spiritual, social and environmental dimensions. It emphasizes the perspective of the individual, saying that quality of life is the degree of enjoyment that results from possibilities that have taken on importance to each person.
The model does not focus on any specific population (either seniors or people with disabilities) saying that there is no distinct set of criteria for good Quality of Life (Raphael, et al., 1997), and it does not focus specifically on illness or disability. It takes the view that health and well-being is a concept that is generalizable to all people, and the components of quality of life are the same for all. It also incorporates the value of personal control by each person over his or her own life.

5.1 Quality of Life Model

The Centre for Health Promotion's Quality of Life (QOL) model is a newly developed generalized model of quality of life. This model was developed to provide a measure that considers both the components and determinants of health and well-being (Raphael, et al. 1997b). It takes a dynamic and flexible view of quality of life, examining people's physical, psychological and spiritual (sense of belonging) perceptions of well-being, and emphasizes individuals' personal control. It basically asks the question: "How good is your life for you?" It is based on the fundamental assumptions that: (a) the concept of quality of life applies to all people; (b) that quality of life means "the degree to which a person enjoys the important possibilities of his/her life"; (c) that the concept of quality of life is multi-dimensional and interrelates many aspects of a person's life including work; (d) that the concept of quality of life includes the notion that people want to maximize their personal control (Raphael 1996b, p.81).

The model is based on a conceptual approach influenced by the humanistic-existential tradition (Bakan, 1964; Becker, 1971; Merleau-Ponty, 1968; Sullivan, 1984; and Zaner, 1981) which recognizes that individuals have physical, psychological and spiritual dimensions. It acknowledges that people need to feel they belong to places and social groups, and need to be able to express themselves as individuals by pursuing personal goals, make choices about their lives, and make decisions that affect their lives (Renwick, et al. 1996).

The conceptual framework of the Health Promotion's Quality of Life model is divided into three identified domains of living: Being, Belonging and Becoming (Raphael, et al. 1996b), and looks at the satisfaction people feel with nine sub-components of their lives.

* The Being domain reflects "who one is" and its three sub-
components are physical, psychological, and spiritual being. It is concerned with how satisfied people feel with their body and their health (physical), their thoughts and feelings (psychological), and their beliefs and values (spiritual).

* The Belonging domain concerns the person’s fit with his/her environment and its three sub-domains are physical belonging, social belonging, and community belonging. It is concerned with how satisfied people feel with where they live and spend their time (physical), the people around them (social), and their access to things (community and employment).

* The Becoming domain refers to the purposeful activities carried out to express oneself and to achieve personal goals, hopes and aspirations. Its three components include: practical becoming, leisure becoming, and growth becoming. It is concerned with how satisfied people feel with their daily activities (practical), what they do for enjoyment (leisure), and what things they do to promote the maintenance of or improve their knowledge and skills and adapt to change (growth).

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<th>COMPONENTS</th>
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<td>BEING (Who a person is as an individual)</td>
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<td>Spiritual Being</td>
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<tr>
<td>BELONGING (How the environment and others fit with the person)</td>
<td>Physical Belonging</td>
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<td>Psychological Belonging</td>
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<td>Social Belonging</td>
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<tr>
<td>BECOMING (What the person does to achieve their hopes, goals, and aspirations)</td>
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<td>Growth Becoming</td>
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**Figure 4. The quality of life model: Essential components and subcomponents**

The quality of life model has a number of components (such as physical being, physical belonging and growth becoming) that may be linked to a person’s satisfaction with their workplace environment and consequently there is reason to believe there should be links between this model and the control/demand, effort-reward imbalance, and the workplace communication models.

5.2 Quality of Life Empirical Research

The Raphael et al. (1996) Quality of Life construct has led to the development of a number of different sets of measures for people with developmental disabilities (Raphael, Brown, Renwick & Rootman, 1996a; Woodill et al. 1994), adolescents (Raphael, Rukholm, Brown, Hill-Bailey & Donato, 1996) seniors living in the community (Raphael, Brown, Renwick, Cava, Weir & Heathcote, 1995), and people with physical and sensory disabilities (Rudman, Renwick, Raphael & Brown, 1995). These studies have included an examination of the relevance of the various domains to the individual populations, and have received significant input from the individual groups in creating items specific to their needs. These measures has undergone continuous validation and have generally been found to be reliable (Raphael, 1997).

The research into the quality of life of seniors using this model had a sample of 205 seniors (Raphael et. al. 1995). The average age of the respondents was 73 years (sd=6.97), 23% were male and 77% were female. Ten percent indicated incomes of less than $6,000 while 14% reported annual incomes of $50,000 or higher. Some of the findings were that education and age did not relate to any of the nine domains. Age was only barely significantly related to physical being. But health status was related to all nine domains. They conclude that evidence from the study shows that there are significant differences in functioning that occur among seniors even in the absence of medical pathology. These differences have been described as involving the distinction between pathological, normative and optimal aging.

The Quality of Life Profile measure has also been used to examine health and well-being among a group of service agency employees and
volunteers (Raphael, D'Amico, Brown & Renwick, 1998). This group were asked to do the questionnaire to sensitize them to issues that their clients deal with, and to familiarize them with the quality of life concept. The Being domains were rated as the most important and the Becoming domains the least so. Greatest satisfaction was found among the Belonging domains. Raphael et al. note that very high satisfaction scores were obtained for spiritual being, physical and social belonging, and practical becoming. They conclude that the measure appears to “reliably discriminate even among individuals who are generally well and also demonstrated some suggestive relationships with self-reported health, age, and perceptions of personal control.”

5.3 Implications for this study

Only one model of quality of life has been examined for this study. This model takes a broad enough overview of well-being that it seems to capture a range of issues that have been hinted at in the workplace literature, and it seems possible to use this model to make links between workplace stress and quality of life. It takes a broad conceptualization of well-being. It examines psychological, physical, social and spiritual dimensions of quality of life. It emphasizes social participation, and it focuses on both physical health as well as the ability to adapt to change.

Particularly significant for this thesis is that this model assumes that quality of life will incorporate the notion of maximizing personal control and choice, a concept strongly emphasized in the workplace stress literature (Raphael et al., 1996). But to this date, research has not allowed for any conclusion concerning the direction of the effects of the control and quality of life relationship. Raphael writes (1998), “If Control scores could be demonstrated in longitudinal studies to be predictive of Quality of Life, it would support the increasing importance being ascribed to Control as a determinant of health” (Raphael, 1998). Significantly, this model has not yet been applied within the workplace. This thesis will be furthering the already existing research in this needed area.
6. Spillover Effect

The thesis guiding this study is that conditions of stress in the workplace will affect quality of life. Four models and empirical research have now been separately examined: the job strain model, the effort-reward imbalance model, the yin/yang communications model and the quality of life profile model. What seems to be needed is an examination of the mechanisms by which workplace stress can spillover into quality of life. The following section examines “spillover” models and research. It gives an overview of theories and conceptual models that have examined the effect of work on home life, and home life on work.

From Karl Marx to Learning Theorists
Even if work is defined narrowly to be that which is performed in the context of the specific activity known as employment, we are at work for a third of our day and what happens at work may profoundly influences the rest of our lives. This is not a new or profound insight; it has been a source of discussion from Karl Marx’s sociological and political writings in the 19th century to recent developments in Organizational Behavior theory and psychological social learning theory.

In 1844 Karl Marx wrote that the essence of our sense of freedom is in our work, and demonstrated a strong reciprocity and interrelationship between work and the rest of one’s life (Marx, 1844/1963; Ollman, 1971). Marx believed that the essence of what makes us human is spontaneous, creative labor; that our “species life” is defined by conscious activity, that productive activity can be seen as human life itself, and that the estrangement and breakdown of the interconnected elements between work and the rest of one’s life makes us less than human. Marx called for “spontaneous, creative labor”. He defined a healthy workplace as one that will allow, “the worker to feel fulfilled. . . have a feeling of well-being . . . feel free to develop his mental and physical energies . . . feel himself at home . . . feel satisfied?” (Marx, trans. 1963, p. 125).

More recently, in the psychological literature, social learning theorists such as Julian Rotter, Albert Bandura and Walter Mischel have also been making the link between personality characteristics such as self-concept, repression and cognition, and family relationships and environmental influences (Phares, 1984). They specifically set out to predict and understand human behavior in a social setting (such as the workplace).
One of Rotter's basic concepts is "expectancy": in one situation a person will have the expectancy that hard work will pay off, but in another situation, the expectancy regarding the utility of hard work will be low. This concept can be seen to link to Siegrist's concept of effort-reward imbalance, as previously discussed. Rotter (1982) has also described six basic psychological needs, one of which is particularly pertinent for this study, and that is the need for independence — the need to make one's own decisions and be in control. Rotter predicts that neurotic or anxious behavior will result when people's expectations and needs are not met, and in therapeutic situations, he not only uses the goal of insight, but also environmental manipulation (for example, guiding the patient to change their job) to achieve behavioral change.

Bandura (1997), complementing Rotter's theory, has a concept of "reciprocal determinism" that says that behavior can best be understood by considering it as a joint product of personal variables and environmental ones. In line with cognitive theorists, he believes that the perception of oneself as competent and in control can exert a strong effect on a person's anxieties and defensive symptoms. He also emphasizes the role of biological, socioeconomic, ethnic, and cultural factors.

Walter Mischel, like Bandura, aligns himself with the cognitive movement within the social learning framework (Mischel, 1981). He takes a strong "interactionist" approach where the influence of both the personal and situational factors are stressed. His theory proposes that people do not passively receive information and meaning from their environment; they actively exercise considerable self-control.

6.1 Spillover models

The link between stress in the workplace (the public domain), to strain within the private domain, has not been subject to much empirical research. The research that has been done has offered varying models of "spillover" that give a theoretical structure to the idea that if you are overworked or are not happy with your work, do not have enough money, are experiencing a marital breakdown, or are responsible for children and aging parents, you will experience mild to serious health effects, from the physical to the psychological.

In their overview of the literature on spillover, McCubbin,
Thompson, Kretzschmar, Smith, Snow, McEwen, Elver and McCubbin (1992), say that the research conducted over the last decade has not demonstrated sufficient clarity to draw conclusions or to make precise predictions of causality. One of the contributing factors for this lack of conclusive evidence they say, lies in the variability of conceptual frameworks that have informed this research.

McCubbin et. al. (1992) identify three conceptual frameworks underlying spillover theory. The first sees the family and the workplace environment as totally separate systems. The family is viewed as a haven from the workplace; it is seen as a resistance resource and as acting as a buffering and stress-reducing environment.

The second model is the spillover effect model where either system can be seen as effecting the other. “It acknowledges that family members are most often part of both work and family systems, a dynamic that more often than not entails strains, overloads, conflicts, all of which may spillover from one setting to the other” (McCubbin, 1992, p. 124). Roles and role conflicts emerge as important factors, with role overload, conflicting expectations and varying vulnerability being core to this picture where boundaries are seen as permeable.

The third spillover model goes a bit further and says that role conflict is not an adequate explanation. It says that work and family life are interdependent and their influence is reciprocal and interactive. “This framework emphasizes the joint effects upon the psychological and physical well being of family members in the workplace. Work and family connections and interactions, reactions to work, coping, network support, the use of resources at work and in the family are but a few of the factors that impact upon the well being of individual members” (McCubbin, 1992, p. 125).
McCubbin et. al. have developed this third conceptual framework into a Resilience Model of Family Adjustment and Adaptation (McCubbin & McCubbin, 1991), which attempts to explain the complex interaction between the family and work environment that shapes a person's well being. This model is presented for its systems orientation, its acknowledgment of both the psychological and social level of analysis, and the model's acknowledgment that workplace stress affects the family as much as the family affects workplace stress is important.

![Diagram of Resilience Model of Family Adjustment and Adaptation]

**Figure 5. Spillover effect model**

Resilience model of adjustment and adaptation: Family, work and health risk.

This complex model says that the health risk of employees, as an index of an individual's adjustment or maladjustment, is determined by the interaction and joint influence of both the family system and the work environment, specifically — by (V) family pressures and work pressures — interacting with (T) the family's types and established patterns of functioning — interacting with (C) the family's appraisal of the situation — interacting with (PSC) the family's problem solving and coping skills, which in turn — interact with (B) the family's resistance resources and social support. These factors also interact with processes in the work environment, namely — the organizational climate of support — interacting with organizational problem solving — and organizational communication.

6.2 Spillover Empirical Research

The essence of all spillover research is to demonstrate that there is no clear boundary or distinction between the public and the private domains. What happens at work will affect home life, and stress at home will, in turn, affect functioning at work. The empirical research looking at how health and health-related behaviors of employed men and women are influenced by both work and family characteristics, lends weight to this study's hypothesis that workplace conditions will affect quality of life.

The empirical research into the spillover effect has focused on a number of specific areas: how conflict in the workplace can spillover into stress in one's private life, and visa versa; gender differences, i.e. how the double workload of family and employment (children or aging parents) especially affects women (and how women may experience control in the workplace differently from men); and how a positive work environment carries over into social and community activity during leisure hours. Examples of each of these kinds of research is given.

6.2.1 Interaction between work and private-life
Research findings in this substantive area strongly support the idea that the family system and the work environment are interactive and help shape the health and well being of employees. This research is typified by the work by McCubbin et. al. (1992), who, building on their Resilience Model of Family Adjustment and Adaption, conducted a study on 117 women and 39
men comparing resilience (low health risk) with vulnerable (high health risk) subjects. They not only found strong links between workplace stressors and family factors, but found that what is considered a stressor by men, is not necessarily considered a stressor for women.

Using stepwise discriminant analyses, they found six family and eight work factors that predicted health risk with 86.3% accuracy for female employees, and six family and four work factors predicting health risk for male employees with 87.2% accuracy. What is interesting to note is that the stresses are not uniformly negative. The four work factors that predicted health risk for males were: “the manager tends to talk down to employees”; “there are always deadlines to be met”; “there is constant pressure to keep producing”; and “we work together to solve problems”. The eight work factors that predicted health risk for females dominated more than the family system factors. They were: “the manager usually compliments an employee who does something well”; “employees cannot afford to relax”; “there are always deadlines to be met”; most of the unhappy things that happen to us are due to things beyond our control”; “we work together to solve problems”; “We encourage each other to try new things and experiences”: “we will experience a major disruption if we have another problem or change”: “new challenges improve morale”.

Another large study that was done in California (Zedeck, et al., 1988) obtained affective measures from 1,057 employees working in the social services. They were studying affective variables of job satisfaction and burnout and their relationship to the quality of family life. The quality of life measure was obtained from the subjects’ spouses, and the research found that the employees’ affective responses of dissatisfaction and burnout were related to the spousal reports of problems in the family and home life.

One study is notable because one of its major findings is against the trend. Rice, et al., (1992) looked specifically at conflict. This study found that conflict at work had no direct relationship with overall quality of life. On the other hand, this New York survey of 823 adult workers did find that traditional work variables such as job satisfaction were influenced by non-work considerations, and that quality of life variables such as global life satisfaction and nonwork satisfaction appeared to be influenced by work considerations. This study is interesting in that its finding on the non-spillover of conflict in the workplace is an anomaly and seems to go against intuitive logic.
6.2.2 Women and work
Another major body of research into how work and home life spill into each other and affect each other has looked at the experience of women in the workplace and has begun to accumulate evidence that the job experience of men and women differ in important ways (Barnett, 1991).

Woman in the workplace is a relatively new phenomenon. Forty-five percent of the Ontario workforce are now women. This is a new phenomenon. In 1971, about a third of women with pre-school children were in the labour market. By 1993, the figure was 63 percent. In Canada, women’s income is 66 percent of men’s.

Working women usually have two full-time jobs — work that fits the definition of employment (paid), and work in the private sphere, (unpaid). Holding down a full-time job and the responsibility of raising children at the same time, means that women have a different work experience to men. Unlike the workday experienced by many men, for many women, there is not an eight-hour day and then 16 hours recovery time. Working women are working for most of their waking hours, and “work” and “home” spill into each other in a seamless web (Angus, 1994).

Despite the “logic” of the stress argument, there is contradictory empirical evidence on whether work is good or bad for working women. Some research has made comparisons of mental and physical health between working men and women. Another body of research has compared working women with those who are not working and those who are working part-time. Yet another has looked at the difference between working-class and middle-class women.

There is also a debate on whether work is good for all women, or whether its effects may be inconsistent when mothers of babies or young children are specifically examined. On this debate, an overview of research published since 1980, examining sources of stress within the workplace and the private domain on women who are pregnant, found that a combination of several types of physical activities and psychological demands tend to be associated with more adverse birth outcomes (Woo, 1997).

On the positive side, work allows women to broaden their social support, not feel so isolated, improve their self-confidence, and become independent, but this is probably only true for middle-class working women (Romito, 1994). Supporting the argument that work is good for
women is a research study on 324 employed men, 203 employed women and 155 female homemakers (Weidner, et al, 1997). This study looked at standard coronary risk factors and psycho-social variables (including job strain and medical symptoms) associated with work and non-work. They found that employment is associated with enhanced medical and physical well-being among women.

On the negative side, work can be a source of both physical and psychological stress if women feel that they do not have a sense of control, have abusive supervisors, do not have enough money, and have stressful parental responsibility. Karasek and Theorell (1990) have reported that the average level of decision latitude (control) among employed women is markedly lower than it is among employed men. They found a major difference in job strain (interaction between high demand and low control) for men and women. Women's high-demand jobs tend to have low control, whereas men's high-demand jobs are often higher in decision latitude. They go on to conjecture that since decision latitude is more available to men, it may be less important to women as a job-stress mitigator (this argument is being debated [Hendrix, Spencer and Gibson, 1994]).

Another recently published study with analyses based on a 33-year follow-up of the 1958 British birth cohort (Matthews, et al, 1998) took a broader view of psycho-social work characteristics and outcomes. They found that women reported more negative work characteristics than men primarily because of differences in learning opportunities and monotonous work. On the other hand, they found that women working full-time were better off (reported fewer negative characteristics) than those working part-time or compared to those who are home-workers. But looking at the issue of control, home-workers reported feeling in control of their work more often than full-time or part-time workers — despite greater monotony and less opportunity to learn.

An Ontario-based research paper (York Centre for Health Studies, York University, and the Institute for Social Research, 1996) has examined how working women's health has been affected by their work. The "Ontario Women's Work-Related Health Survey," identified stress, repetitive strain injury, harassment and violence in the workplace, and air quality as the chief hazards to women's health. The survey confirmed research showing that women primarily work in highly sex-segregated workplaces, have a smaller number of job options than men, and do different tasks to men even if their job title is the same. They are more likely to be unemployed, have
lower status, don't feel they have control over what they consider important, and feel their work is not valued by society.

At the time of its publishing, this survey invoked particular attention since most previous research into workplace health problems has not included women. A review of the literature in major scientific journals in the 1980s and 1990s, finds that most of what is known about the work-health relationship comes from research based on men working in male-dominated industrial sectors (Messing, 1997).

The survey found that many women find their work environments stressful, but the origins of the stress and its impact on women's mental or physical health could not be simply assessed. The stress comes from accumulated stress from the physical working conditions, the social environment of the workplace, workplace restructuring, and two stresses unique to women — the double day, and sexual harassment. Another source of stress identified by the survey was repetitive strain injuries (RSIs) including carpal tunnel syndrome and inflammation of the joints. These injuries represent 4.7 percent of recognized claims made by women as compared to 1.4 percent of male workers. One of the major distinctions between the work done by men and women, is that men's work can cause traumatic, cataclysmic injuries, but women work in sectors which require repetitive motions. Women are debilitated by accumulated chronic physical stress.

For example, in many female dominated occupations, the women lift thousands of lighter objects a day, unlike men, who lift one heavy weight and then rest. A man hurts his back from lifting a 100 pound sack; a child-care worker in a day lifts and carries 20 children, all weighing between 20 and 50 pounds. A male factory worker loses his hand in a machine press; a VDT operator inputs 15,000 characters per day, or wraps 7920 cakes per hour. A man falls off the scaffold and breaks his leg; yet women workers get more industrial diseases than men (Messing, 1994).

The survey also identified workplace restructuring as a source of stress. The cutbacks, increased workloads, threats of unemployment, and cuts in pay that creates both job and financial insecurity. These changes can be especially stressful for women because they also have pressures over and above these, says the survey.

On the other hand, another research project by Barnett, Davidson and Marshall (1991) has examined the impact of family roles on the relationship between workplace rewards and concerns and physical health
symptoms, and also found gender differences in aspects of the workplace associated with physical health outcomes. Their research was motivated by the need to confirm or contradict the common assumption that employment has a negative effect on the health of women with families.

This research was conducted with 403 employed 25- to 55-year-old women. It specifically looked at whether negative experiences on the job exacerbate the effects of negative family roles; or can negative experiences on the job mitigate the salutary effects on health of a positive family role. The research also examined whether positive experiences at work could protect women from the physical-health effects of negative experiences in their family roles.

They noted that, contrary to widely held assumptions, they found no evidence that overload at work intensified the relationship between problems at home and physical health. Also, they did not find that negative experiences as a parent or as a partner intensified the relationship between overload at work and physical health. Their research only found modest support for the Karasek job control-demand model and found no evidence that overload at work increases the relationship between problems at home and physical health.

6.2.3 The double workload of work and family
Some research has looked at how the role of being a parent can be an important variable when studying work-family conflict, especially on health effects such as conflict, depression, poor physical health and alcohol use (Frone, et al. 1996).

A study in Nova Scotia (Leiter et al. 1996) has examined how spillover is experienced by 151 female hospital workers with families. The study used a structural equation analysis of longitudinal data over a three month period. Subjects completed measures of burnout, mood, work overload, work-family interference, support, and marital satisfaction. They found that a sense of professional efficacy positively affected the work and home domains, and also the boundary between these two domains. The research also found that spillover from work made a much greater contribution to the prediction of family states, than spillover from family did for work states.

Expanding on this theme, Queen’s University (Stewart & Barling, 1996) has done a study on 189 fathers, looking at how work experience
(decision latitude, job demands, job insecurity and inter-role conflict) influences children's behavior (acting out, shyness and school competence). This study provides support for the assumption that the work experience is a critical variable in understanding the link between work and family.

Finally, Galinsky et al. (1996) have examined life on and off the job for a nationally (United States) representative sample of 2,958 wage and salaried workers, comparing the situation of parents and non-parent employees. The research found that employees who are parents exhibited significantly poorer quality of life outcomes (higher levels of conflict between work and family/personal life, more stress, and less effective coping) than those without children. Parents seem to fare better if they have jobs with greater autonomy, more schedule control, fewer demands, and greater security. They also fare better when they have more supportive workplaces (more supportive supervisors, more supportive workplace cultures and opportunities for job advancement that were not inhibited by gender or race).

6.2.4 How work affects leisure activities
The fourth sort of research on the spillover effect, looks at how a positive work environment carries over into social and community activity during leisure hours. There is not a significant body of empirical research to support this theoretical idea, but what research there is similar to Miller and Kohn’s (1983) finding that self-directed work experience improves one's skills and learning, and influences the way a person spends their time during their leisure hours. There is also Evans et al.'s (1994) finding that workers who have jobs where there is low participation and decision making are more likely to watch television than get involved with their community.

Karasek and Theorell have began looking at wider social implications of workplace control and demand (Karasek & Theorell, 1990), stating that, “Clearly there are reciprocal effects of the family on work behavior” (Karasek and Theorell, 1990, p. 76). To this end, they have conducted research with full-time Swedish male and female white-collar workers that shows that psycho-social situations at work appear to have a greater impact on overall psychological and physical well-being than do family situations (Karasek, et al, 1987). They quote a number of studies that
make a link between job strain and health effects outside the workplace,
and show a relationship between jobs that have high psychological demands
and low decision latitude and high blood pressure during leisure hours
(Theorell, 1996).

The idea of “active” jobs creating more active people in leisure
hours is part of Karasek and Theorell’s (1970) active-passive diagonal as
described earlier in the section on the Job Strain model. Theorell notes that
epidemiological studies indicate that those people who have “active” job
situations (high control and high demand) have a higher rate of
participation in socially active leisure and political activities (Karasek &
Theorell, 1990). This particular research has been supported by the
Whitehall II Study (Marmot et al.; 1991), which found that the social
gradient followed Karasek’s active-passive diagonal and not the strain
diagonal.

Siegrist has also attempted to broaden his analysis, but not from
work to the family as such, but from the macro economic sphere to work.
One of the major strengths of his effort-reward imbalance model is its
notion of status control (within the Reward domain) that is largely
determined by such external forces such as the health of the job market,
structuring and globalization of the labour market. The status control
factor makes the link to Herbert Mead’s sociological theory of self and
identity (Mead, 1934), that speaks to how the interruption or loss of the
continuity of crucial social roles can be very threatening. Furthermore,
Siegrist’s research with Bosma et al. (1997) (as described in detail in
Chapter 4), which investigates the link between social gradient on ill health,
specifically takes a look at how work characteristics and social support are
influenced by the general labour market.
6.3 Implications for this study

The empirical research findings in the spillover field seem to be contradictory and inconclusive. The direction of stress seems to be an issue. There seems to be little agreement on whether stress at work affects home life, or whether it is conflict at home that is affecting job satisfaction. There is also little agreement on whether being in the labour force is good or bad for women.

The measures used by some of this research are also open to question. Much of the research is not based on strong theory, and just about every variable possible has been thrown into the research, including the Karasek variables. But despite these contradictory and unsatisfactory findings, the essence of the research seems to be that work and home life are not clearly defined domains, and since there is a spillover effect between the two domains, it is worthwhile to examine how workplace conditions affect a person’s quality of life.

This study looks at the workplace with “new” workplace measures. It will also be using a relatively new quality of life measure to test the hypothesis that workplace stressful conditions affect quality of life. It will focus on three of the quality of life domains — physical being, physical belonging, and growth becoming — which are the strongest links to workplace satisfaction.

Using the Karasek Job Strain model, this study focuses on the difference in perception of control and psychological demand between blue- and white-collar workers, using employment grade levels is an important variable. It examines the active-passive learning diagonal that predicts higher community involvement among workers with positions of high-psychological demand and high-control, specifically focusing on the community belonging sub-domain within the quality of life measure.

Using the Effort-Reward Imbalance model, this research follows on Siegrist’s conjecture that reduced expectancy may operate to minimize one’s efforts (equalizing out the effort-reward imbalance) especially among blue-collar workers who have limited opportunities to change jobs due to structural unemployment and rapid socioeconomic change.
The objective of this study is to examine the relationship between hierarchy in the workplace, stressful workplace conditions and quality of life.

This thesis is based on a Workplace-Quality of Life model. The model is a three-layered, trickle-down, concept; workplace hierarchy affects individual workers' experience of stress in the workplace, and in turn, workplace stress spills over into individuals' perceptions of their quality of life.

This study hypothesized that workplace hierarchy would determine how stressful the workplace is for workers, and that these stressful workplace conditions would in turn affect how workers perceive their quality of life. The model attempts to integrate the existing knowledge on hierarchical workplaces, stress, control, fairness, and effective communication in the workplace, and spillover into the private domain.

Workplace hierarchy was measured by using this worksite's employment grade levels. Workplace stress was measured with the variables of control and demand, fairness, and organizational communication. Workers' perceptions of their quality of life was measured with the quality of life profile.
**Figure 6.** Workplace-Quality of Life model
The theory that underlies this research study has built upon French et al.'s (1982) and Siegrist's (1996) idea that one needs to acknowledge the interplay between the objective components of the work environment, and the subjective experiences of the person, when one is looking at the role of work in people's lives. Five models were used to inform this research: the Karasek job strain model, the Siegrist effort-reward imbalance model, the yin/yang communication model, the spillover effect model, and a quality of life model.

Karasek's well-established job strain model was used as the primary indicator of stress in the workplace. This model predicts that people with high strain jobs (high demand and low control) will have higher stress and hence lower health indicators. This thesis is predicting that high strain not only predicts health outcomes, but also quality of life.

The Karasek indicator was supplemented by the newer Siegrist effort-reward imbalance model. The Siegrist model adds an explicit psychological component (the individual attribute of the need for control), as well as the concepts of the need for a balance between job demands and esteem, occupational status and financial rewards, which the job strain model does not have. The scale used in this study to measure the Siegrist's effort-reward imbalance model focused on the concept of "fairness" that underlies the model's conceptualization. Six questions made up the measure — three on effort and three on reward. This is the first report to use this specific measure of the model.

The worksite yin/yang communications model was also included since, again, it was felt that it would lend further insight to the analysis by focusing on worker job satisfaction localized at this particular work site. This measure focuses on communication and offers this research a more in-depth perspective on the efficiency of communication, the level of perceived participation, as well as satisfaction with received feedback.
Using the quality of life model, this research predicted there would be a particular relationship between stressful workplace conditions and certain aspects of the quality of life model that specifically relate to work. Three of the nine Quality of Life sub-domains are hypothesized to be particularly relevant to workplace conditions: physical belonging, community belonging, and growth becoming.

The physical belonging sub-component was focused upon since it was felt that a person’s workplace conditions would affect the way they perceived overall satisfaction with the way they live and spend their time. The community belonging sub-component was particularly examined in light of the Karasek “active/passive job” diagonal that predicts that workers with active jobs (high control and high demand) are more likely to be involved with their community outside the workplace. Thirdly, it was hypothesized that there would be a relationship between the growth becoming sub-component and employment grade level, since this component of quality of life could reflect the possibility that the higher up a person is in the workplace hierarchy, the greater their opportunity to engage in purposeful activities such as work and learning on the job, in order to achieve their goals, hopes and aspirations.
8. Research Questions and Hypotheses

The objective of this study is to examine the relationships among hierarchy in the workplace, stressful workplace conditions and quality of life.

8.1 Research Questions
This study examines the relationship between workplace conditions to quality of life among blue- and white-collar workers at an Ontario automotive parts manufacturing plant.

The overall research questions are:
1. Do workers in different employment grade levels experience job stress in this workplace differently?
2. Is there a relationship between stressful workplace conditions and quality of life?

8.2 Research Hypotheses

Integrating the existing knowledge on stress, control, spillover effect, difference between blue-and white-collar workers and quality of life, there is an expectation that there will be a relationship between workplace conditions and quality of life.

To this end, this study will test four different kinds of hypotheses:
1. Those that focus on employment grade level.
2. Those that examine how Karasek's Job Strain measure relates to quality of life.
3. Those that examine how the workplace variables of Fairness, Communication and satisfaction with physical health relate to quality of life.
4. How gender relates to occupational status and the Job Strain measures.
8.2.1 Focus on Employment grade level

**Hypothesis one** predicts that employment grade levels will be related to Control and Psychological Demand scores — specifically, that the professional group would have higher means on the Control and Demand measures than the hourly shop-floor workers.

**Hypothesis two** predicts that employment grade levels will be related to the Fairness scores — specifically, that the professional group would have higher means on the Fairness measures than the hourly shop-floor workers.

**Hypothesis three** predicts that employment grade level will be related to the communication scores — specifically, that the professional group would have higher means on the Communication measures than the hourly shop-floor workers.

**Hypothesis four** predicts that employment grade level will be related to the quality of life measures — specifically, that the professional group would have higher means on the overall quality of life measures and its nine subdomains than the hourly shop-floor workers.

8.2.2 Focus on Karasek’s measures and QOL

**Hypothesis five** predicts that the two Karasek measures, Control and Psychological Demand, will be correlated with the overall Quality of Life score. They should also be especially correlated \( (p < .01) \) with the subdomains of physical belonging, community belonging and growth becoming.

**Hypothesis six** predicts that Karasek’s psycho-social job-types (passive and active jobs, and low- and high-strain jobs) will be related to the Quality of Life scores.
8.2.3 Focus on Fairness, Communication and QOL

**Hypothesis seven** predicted that the Fairness scores would be correlated with the Quality of Life scores.

**Hypothesis eight** predicted that the Communication scores will be correlated with the Quality of Life scores.

8.2.4 Focus on health, gender and QOL

**Hypothesis nine** predicted that the Satisfaction with one’s physical health (physical being question 6) scores will be correlated with the Quality of Life scores.

**Hypothesis ten** predicted that women workers would have higher Job Strain scores and lower Quality of Life scores than male workers.
9. Methodology and Procedure

9.1 Participants
The study population consisted of a group of 64 employees out of a possible 173 staff members at an automotive parts manufacturing facility in southern Ontario.

This study followed a cross-sectional design that relied on correlations and examination of relationships. The N of 64 in this study is considered adequate for statistical purposes, but not adequate for representational purposes. The sample size is considered adequately greater than the critical N=54, a level suggested for adequate model fit for attempting to identify a correlation of .30 or more among continuously distributed variables (Cohen and Cohen, 1983), but lower than the 100 people per occupational group as suggested by Karasek (1985). On the other hand, Karasek says that a sample size of 50 should allow for detection of a scale score difference of .5 standard deviations, a moderate effect according to Cohen and Cohen.

9.2. Measures
Paper and pencil measures were administered to the workers. This research has used a combination of four scales based on four theoretical models: the Karasek Job Content questionnaire is based on the Job Strain model (see Figure 1, pg. 8), the Fairness scale based on the Siegrist effort-reward imbalance model (see Figure 2, pg. 14), the Communications scale based on the yin/yang communications model (see Figure 3, pg. 17), and the Quality of Life Satisfaction scale based on the quality of life model (see Figure 4, pg. 29).

The Job Content questionnaire was developed by Karasek & Theorell (1985), the Fairness scale was developed by Shain (1998), the Communications scale is from the private sector, and the Quality of Life Satisfaction scale was developed by the Centre for Health Promotion (Raphael, D'Amico, Brown, & Renwick, 1997c). (For the complete questionnaires, see Appendix B.) Subjects were also asked seven demographic questions: age, marital status, gender, length of employment, level of education, dependents, and employment grade level.
Table 1. *Construct, measures, and scoring of the four scales*

<table>
<thead>
<tr>
<th>Model</th>
<th>Measures</th>
<th>No. of items</th>
<th>Scoring</th>
<th>Established Cronbach alpha</th>
</tr>
</thead>
<tbody>
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<td>Karasek Job Strain</td>
<td>Job Content Questionnaire</td>
<td>3-decision authority</td>
<td>1 (strongly disagree) to 4 (strongly agree)</td>
<td>.96</td>
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<tr>
<td></td>
<td></td>
<td>6-skill discretion</td>
<td></td>
<td>.74</td>
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<tr>
<td></td>
<td></td>
<td>9-psych. demand</td>
<td></td>
<td>.96</td>
</tr>
<tr>
<td>Siegrist Effort-Reward Imbalance model</td>
<td>Shain’s Fairness scale</td>
<td>3-effort</td>
<td>1 (disagree strongly) to 5 (agree strongly)</td>
<td>Not previously used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-reward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yin-yang communications model</td>
<td>Communications scale (sugg. by management)</td>
<td>5-effectiveness of communication; 5-using workers skills.</td>
<td>1 (disagree strongly) to 5 (agree strongly)</td>
<td>Not previously used</td>
</tr>
<tr>
<td>Quality of Life profile</td>
<td>Raphael’s 54 item Satisfaction measure</td>
<td>18-Being</td>
<td>1 (not at all) to 5 (extremely)</td>
<td>.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18-Belonging</td>
<td></td>
<td>.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18-Becoming</td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>Demographics</td>
<td>age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>length of employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>level of education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>dependents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>employment grade level</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.3 Procedures

Company X was selected for this study because it is an exemplar of excellence. It has focused on quality assurance, benchmarking against other world-class companies, research and development, and an investment in their workers. It is a privately-held, non-unionized company. (A company profile is included in Appendix C).

This author made initial contact with the company in her role as a journalist to write a profile of the company for an engineering magazine. This initial entree facilitated her subsequent access as a researcher, when she again approached the director of the company to gain permission to conduct the research after explaining the nature and purpose of the study. The questionnaire and a verbal outline of the research project was also presented to the management team at an executive meeting for discussion and approval, which was given. A commitment was made to the company that the researcher would write a summary of the research findings so that they could be published in the company's newsletter.

In April 1998, the company’s executive had a scheduled meeting to deliver their quarterly report to the full workforce. It was decided that these meetings (there were three meetings scheduled to include all three shifts) would be a good opportunity to deliver the survey questionnaires to all the workers and staff.

At the time, it did not seem to be an ideal day to distribute questionnaires on quality of life, since the president’s presentation to the workforce was quite depressing. He told his workers that productivity had gone down 25 percent that quarter. He expressed his deep concern, reassured his workers that there would be no layoffs and he would continue to expand his company, but he did warn everyone that they would have to start working “smarter”. This did have a dampening effect on morale.

On the other hand, the meetings were an ideal opportunity to let the whole workforce know about the research. At the meetings, the manager of human resources gave details about the research, introduced the researcher, informed the staff that everyone would receive a questionnaire, told the staff the company had endorsed the research, and emphasized that participation was totally voluntary and their answers would be kept strictly confidential.

The questionnaires, in a brown envelope, were distributed to all 173 workers on that day. A covering letter and a consent form was included.
which clearly explained the purpose and nature of the study. The letter covered the issue of anonymity and every one’s right to not participate. The participants were asked to sign the consent form and hand it in separately from their filled in questionnaire.

The questionnaires were completed individually and anonymously (completion took about 30 minutes). Reliability was enhanced by the uniform distribution of the questionnaires, and all respondents answering the same standardized questions (Robson, 1993). Anonymity was assured as no identification was requested on the questionnaire by the investigator. This protected the subjects’ interests and identity. One subject expressed concern that his identity could be established by the demographic information. His concern was allayed when the process of data analysis was explained.

Questionnaires were returned over a period of a week. Participants returned their questionnaires in the now-sealed envelopes in a box placed in the Human Resources department with the consent form collected separately. Eight extra copies of the questionnaire were distributed during the week to staff members who had been absent on April 21. This procedure has been tested and used in many empirical studies using similar measuring instruments without harm to their participants.

The data was collected, checked and coded for data processing and statistical analysis. The Statistical Package for the Social Sciences (SPSS-for Mackintosh Version 6.1, 1995) was used for this purpose.
10. Results

10.1 Demographics

Table 2 contains demographic characteristics of the sample.

Table 2. Characteristics of the participants
(n=64)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sub-variable</th>
<th>Freq (n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job classification</td>
<td>Professional</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Office staff</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Salary production</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Hourly production</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td>Education</td>
<td>Finished elementary</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Some high school</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Finished high</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Some community</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Finished community</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Some university</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Finished university</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Employment</td>
<td>Under 1 year</td>
<td>19</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>1-4 years</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>5-9 years</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>10 to 14 years</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>41</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>23</td>
<td>36</td>
</tr>
<tr>
<td>Age</td>
<td>20-29</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>40-49</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>50 or over</td>
<td>12</td>
<td>19</td>
</tr>
</tbody>
</table>
Respondents indicated a range of levels of education, employment tenure, and age. About one-third of the respondents were female, half indicated that they were looking after dependents (children or elderly parents). Seventy-two percent were married.

In order to test the hypotheses predicting that employment grade level would be related to job stress and quality of life, four types of employees were sought based on company job descriptions. These were hourly production employees, salaried production employees, office administrators, and a group of professional staff (managers, engineers and executives).

A second level of analysis reclassified the employees into blue- and white-collar workers. Blue-collar workers were classified by combining the hourly production workers and the salaried production workers (n=40). White-collar workers were classified by combining the administrative and professional staff (n=24).

10.2 Study Measures

Table 3 contains the means and standard deviations for the major study measures: Demand, Control, Fairness, Communication, overall Quality of Life, and the nine sub-domains of quality of life. The table also includes the Cronbach alphas for each of the scales. In every case, the Cronbach alpha exceeded .70, indicating acceptable levels in terms of internal consistency.
Table 3. Mean scores, standard deviations and Cronbach alphas of Demand, Control, Fairness, Communications, overall Quality of Life and the nine sub-domains of quality of life. (n=64)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>2.89</td>
<td>.53</td>
<td>.79</td>
</tr>
<tr>
<td>Control</td>
<td>2.89</td>
<td>.53</td>
<td>.81</td>
</tr>
<tr>
<td>Fairness scale</td>
<td>2.95</td>
<td>.89</td>
<td>.81</td>
</tr>
<tr>
<td>Communication scale</td>
<td>3.26</td>
<td>.80</td>
<td>.88</td>
</tr>
<tr>
<td>Quality of Life scale</td>
<td>3.64</td>
<td>.46</td>
<td>.94</td>
</tr>
<tr>
<td>Being--Physical</td>
<td>3.75</td>
<td>.61</td>
<td>.81</td>
</tr>
<tr>
<td>--Psychological</td>
<td>3.56</td>
<td>.62</td>
<td>.80</td>
</tr>
<tr>
<td>--Spiritual</td>
<td>3.90</td>
<td>.60</td>
<td>.75</td>
</tr>
<tr>
<td>Belonging-Physical</td>
<td>3.98</td>
<td>.58</td>
<td>.75</td>
</tr>
<tr>
<td>-Social</td>
<td>3.63</td>
<td>.73</td>
<td>.83</td>
</tr>
<tr>
<td>-Community</td>
<td>3.43</td>
<td>.64</td>
<td>.71</td>
</tr>
<tr>
<td>Becoming-Practical</td>
<td>3.52</td>
<td>.65</td>
<td>.75</td>
</tr>
<tr>
<td>-Leisure</td>
<td>3.38</td>
<td>.74</td>
<td>.79</td>
</tr>
<tr>
<td>-Growth</td>
<td>3.61</td>
<td>.65</td>
<td>.80</td>
</tr>
</tbody>
</table>

Generally these scores fell on the positive end of their dimensions. Workers showed the highest satisfaction with aspects of physical belonging, physical being, and social belonging; the lowest with leisure becoming, community belonging, and practical becoming.
Table four contains the correlation matrix of the job stress scales.

Table 4. Correlation matrix of the four study measures: control, demand, fairness, and communication (n=64)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control</td>
<td>—</td>
<td>-1.3</td>
<td>0.45**</td>
<td>0.40**</td>
</tr>
<tr>
<td>2. Demand</td>
<td>—</td>
<td>-0.41**</td>
<td>-0.27*</td>
<td></td>
</tr>
<tr>
<td>3. Fairness</td>
<td>—</td>
<td></td>
<td>0.71**</td>
<td></td>
</tr>
<tr>
<td>4. Communication</td>
<td></td>
<td></td>
<td></td>
<td>—</td>
</tr>
</tbody>
</table>

**Note.** *p < .05. **p < .01.

All of the measures, except for the control and demand measures, were inter-correlated. The results indicate that these scales are all tapping some similar aspect of psycho-social functioning.
10.3 Focus on employment grade level

Hypotheses one to four examine the relationship between the first two layers of the Workplace Conditions and Quality of Life model (Figure 6, page 45). The model predicts that workers with different employment grade levels will score differently on the various job-related study variables (control, demand, fairness, and communication), which, in turn, affect the quality of life measures. Table five contains the means and the standard deviations for the control and psychological demand measures, the Fairness measure, and the Communication measure for the four different employment grade levels.

Table 5. Mean scores and standard deviations on job-related measures as a function of employment grade level (n=64)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Hourly Production (n=30)</th>
<th>Salary Production (n=10)</th>
<th>Administrative Group (n=9)</th>
<th>Professional Group (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Control</td>
<td>2.69 .56</td>
<td>2.78 .47</td>
<td>2.86 .43</td>
<td>3.21 .42</td>
</tr>
<tr>
<td>Psych. Demand</td>
<td>2.73 .53</td>
<td>2.87 .61</td>
<td>2.88 .45</td>
<td>3.23 .40</td>
</tr>
<tr>
<td>Fairness</td>
<td>3.01 .96</td>
<td>2.77 .67</td>
<td>3.20 .79</td>
<td>2.80 .97</td>
</tr>
<tr>
<td>Communication</td>
<td>3.32 .87</td>
<td>3.23 .86</td>
<td>3.50 .81</td>
<td>3.01 .63</td>
</tr>
</tbody>
</table>

The four hypotheses looking at employment grade level and differences in job-related measures were tested using analysis of variance. While these are directional hypotheses, it was decided to use a conservative test (i.e. two-tailed) to examine these hypotheses. This would minimize the possibility of obtaining chance findings. In cases where the F-score indicated significant differences, a Newman-Keuls multiple comparison test identified the specific differences among groups.
#1: Job Strain and employment grade level

*Hypothesis one predicts that employment grade levels will be related to Control and Psychological Demand scores — specifically, that the professional group would have higher means on the Control and Demand measures than the hourly shop-floor workers.*

A relationship was detected between control and demand measures and employment grade level. Differences on the Control scores as a function of employment grade level scores were significant ($F (3, 60) = 3.71, p < .05$). Differences on the Psychological Demand variable as a function of employment grade level scores were also found to be significant ($F (3, 60) = 3.23, p < .05$).

Multiple comparison tests for both variables found that the significant difference ($p < .05$) was between the professional group and the hourly production workers, with the professional group having significantly higher mean scores on control and demand than the hourly production workers. This offers support for the hypothesis that there would be differences between employment grade levels on the control and demand measures.

#2: Fairness and employment grade level

*Hypothesis two predicts that employment grade levels will be related to the Fairness scores — specifically, that the professional group would have higher means on the Fairness measures than the hourly shop-floor workers.*

A relationship was not detected between the fairness scores and employment grade level. Differences on the Fairness scores as a function of employment grade levels were not significant ($F (3, 60) = 1.20$). This finding does not support previous research that found that Fairness in the workplace discriminated among employment grade levels.

While the six items on the Fairness scale seem to constitute a scale, exploratory data analysis examined whether any one of the items by itself discriminated among employment grade levels. One of the six Fairness questions was significantly related to employment grade levels, and that was: "I feel I am well rewarded for the level of effort I put out for my job" ($F (3, 60) = 2.70, p < .05$). Interestingly, multiple comparison tests for this question found that the hourly production workers were significantly more
satisfied with how they are rewarded in the workplace than the professional group.

#3: Communication and employment grade level

Hypothesis three predicts that employment grade level will be related to the communication scores — specifically, that the professional group would have higher means on the Communication measures than the hourly shop-floor workers.

A relationship was not detected between the communication scores and employment grade level. Differences on the Communication scores as a function of employment grade levels were not significant ($F(3, 60) = .75$). This finding does not support previous research that found that effective communication in the workplace discriminated among employment grade levels.

While the 10 items on the Communication scale seem to constitute a scale, exploratory data analysis examined whether any of the items that made up the scale discriminated among employment grade levels. Two of the six Communication questions were significantly related to employment grade levels. One was: “The company’s senior management does a good job of communicating business issues, strategies and results” ($F(3, 60) = 3.69, p < .01$). Interestingly, multiple comparison tests for this question found that the hourly production workers and the administrators are significantly more satisfied with management communication than the professional group ($p < .05$).

The other question was: “I receive on-going feedback that helps me improve my performance” ($F(3, 60) = 2.02, p < .01$). Again, multiple comparison tests for this question found that the hourly production workers were significantly more satisfied with the feedback they receive than the professional group.

The results of hypothesis two and three are particularly interesting. It seems that in this study, that workers are at least as satisfied with workplace conditions, as defined by the fairness and communication measures, as the professionals.
**#4: QOL and employment grade level**

**Hypothesis four** predicts that employment grade level will be related to the quality of life measures — specifically, that the professional group would have higher means on the overall quality of life measures and its nine sub-domains than the hourly shop-floor workers.

Table six contains the means and standard deviations of the overall quality of life scale and the nine sub-domains of the quality of life scale as a function of the four employment grade levels.

**Table 6. Mean scores and standard deviations of overall quality of life measure and nine quality of life sub-domains as a function of employment grade levels**

<table>
<thead>
<tr>
<th>QOL Variables</th>
<th>Hourly Production (n=30)</th>
<th>Salary Production (n=10)</th>
<th>Administrative Group (n=9)</th>
<th>Professional Group (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Overall QOL</td>
<td>3.62</td>
<td>.46</td>
<td>3.44</td>
<td>.54</td>
</tr>
<tr>
<td>Physical being</td>
<td>3.87</td>
<td>.61</td>
<td>3.60</td>
<td>.47</td>
</tr>
<tr>
<td>Psychological being</td>
<td>3.53</td>
<td>.60</td>
<td>3.42</td>
<td>.72</td>
</tr>
<tr>
<td>Spiritual being</td>
<td>3.92</td>
<td>.51</td>
<td>3.49</td>
<td>.76</td>
</tr>
<tr>
<td>Physical belonging</td>
<td>3.99</td>
<td>.57</td>
<td>3.63</td>
<td>.70</td>
</tr>
<tr>
<td>Social belonging</td>
<td>3.66</td>
<td>.66</td>
<td>3.39</td>
<td>1.05</td>
</tr>
<tr>
<td>Community belonging</td>
<td>3.35</td>
<td>.70</td>
<td>3.38</td>
<td>.60</td>
</tr>
<tr>
<td>Practical becoming</td>
<td>3.48</td>
<td>.74</td>
<td>3.47</td>
<td>.49</td>
</tr>
<tr>
<td>Leisure becoming</td>
<td>3.26</td>
<td>.64</td>
<td>3.15</td>
<td>.89</td>
</tr>
<tr>
<td>Growth becoming</td>
<td>3.56</td>
<td>.66</td>
<td>3.40</td>
<td>.70</td>
</tr>
</tbody>
</table>

A relationship was not detected between the quality of life scores and employment grade level. Differences on the overall quality of life score as a function of employment grade levels were not significant (F (3, 60) = 1.27). Further analyses of the potential differences for the nine quality of life sub-domain scores produced similar findings.

p. 64

Workplace- QOL
Table seven summarizes the findings from hypotheses one to four.

Table 7. Summary of testing of hypotheses one to four

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Employment grade level and control</td>
<td>yes</td>
</tr>
<tr>
<td>Employment grade level and demand</td>
<td>yes</td>
</tr>
<tr>
<td>2. Employment grade level and fairness</td>
<td>no</td>
</tr>
<tr>
<td>3. Employment grade level and communication</td>
<td>no</td>
</tr>
<tr>
<td>4. Employment grade level and quality of life</td>
<td>no</td>
</tr>
</tbody>
</table>

The results from these four hypotheses suggest that employment grade level is only a predictor of certain types of workplace stress, and not a direct predictor of overall quality of life. Employment grade level is a predictor of demand and control in the workplace, but not of Fairness or Communication.

These findings lend only partial support to the Workplace Conditions and Quality of Life model (Figure 6, page 45) which in its three-layer structure says that employment grade level will be a determining factor of perceptions of workplace stress, which in turn will be a predictor of overall quality of life. The next set of hypotheses takes away the first layer of the model, and examines the relationship between the second two layers. It examines whether stress in the workplace, as measured by Karasek's job strain, the fairness measure and the communications measure can be a predictor of quality of life.
10.4 Focus on Karasek variables and Quality of Life

Hypotheses five looks at the relationship between the Karasek Control and Demand measures and quality of life. Hypothesis six examines the relationship between Karasek’s Job Strain measure and quality of life. The Job Strain measure is the interaction between the control and demand measures, and separates subjects into four psycho-social job types: high strain, low strain, active and passive jobs.

#5: Control/Demand and QOL scores

*Hypothesis five predicts that the two Karasek measures, Control and Psychological Demand, will be correlated with the overall Quality of Life score. They should also be especially correlated (p < .01) with the sub-domains of physical belonging, community belonging and growth becoming.*

Overall, there was a relationship between control and demand and quality of life. The Control domain was significantly correlated ($r = .31$, $p < .05$) with the overall Quality of Life scale; and the Psychological Demand scale was significantly correlated, negatively, with the overall quality of life scale ($r = -.25$, $p < .05$).

Table eight contains the correlation matrix between Karasek’s two measures, overall quality of life, and the nine sub-domains of the quality of life measure.
Table 8. *Correlation matrix between Karasek's two measures, Control and Psychological Demand, overall Quality of Life, and the nine sub-domains of the quality of life measure (n=64)*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Control</th>
<th>Psychological Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life scale</td>
<td>.31*</td>
<td>-.25*</td>
</tr>
<tr>
<td>1. Physical being</td>
<td>.22</td>
<td>-.09</td>
</tr>
<tr>
<td>2. Psychological being</td>
<td>.24</td>
<td>-.17</td>
</tr>
<tr>
<td>3. Spiritual being</td>
<td>.06</td>
<td>.01</td>
</tr>
<tr>
<td>4. Physical belonging</td>
<td>.47**</td>
<td>-.25*</td>
</tr>
<tr>
<td>5. Social belonging</td>
<td>.01</td>
<td>-.11</td>
</tr>
<tr>
<td>6. Community belonging</td>
<td>.22</td>
<td>-.51**</td>
</tr>
<tr>
<td>7. Practical becoming</td>
<td>.24</td>
<td>-.16</td>
</tr>
<tr>
<td>8. Leisure becoming</td>
<td>.19</td>
<td>-.15</td>
</tr>
<tr>
<td>9. Growth becoming</td>
<td>.38**</td>
<td>-.20</td>
</tr>
</tbody>
</table>

*Note. *p < .05. **p < .01.*

For the control measure, two of the three specific predictions were supportive. The same occurred for the psychological demand measure. This offers some, but not much, support to the spillover theory between workplace conditions and quality of life.
Job Strain and Quality of Life

Hypothesis six predicts that Karasek’s psycho-social job-types (passive and active jobs, and low- and high-strain jobs) will be related to the Quality of Life scores.

The Karasek Job Strain model can be used to divide workers into four psycho-social job types: Passive jobs (low demand and low control); Active jobs (high demand and high control); Low strain jobs (low demand and high control); and High strain jobs (high demand and low control). This analysis allows for an assessment of the interaction of the Demand and Control measures.

7: Employment grade level and job strain

The first analysis looked at the relationship between Karasek’s psycho-social job types and employment grade levels. When the workforce was divided into blue- and white-collar workers, and a chi-square analysis was run with the psycho-social job types, a significant relationship was found ($\chi^2 (3, N = 64) = 10.83, p < .01$). The frequency of white-collar workers that rate themselves as having “active jobs” is significantly higher than would be statistically expected. (This supports the Karasek model that predicts that white-collar workers would be more likely to have “active” jobs than blue-collar workers.) Table 9 contains the frequencies of blue- and white-collar workers as a function of Karasek’s psycho-social job classification.
Table 9. *Frequencies of blue- and white-collar workers as a function of Karasek’s psycho-social job types* (n=64)

<table>
<thead>
<tr>
<th>Job Status</th>
<th>Karasek psycho-social job classification</th>
<th>row total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Passive jobs (low demand/low control)</td>
<td></td>
</tr>
<tr>
<td>Blue-collar</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>62%</td>
</tr>
<tr>
<td>White-collar</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>38%</td>
</tr>
<tr>
<td>Column total</td>
<td>5</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17%</td>
<td></td>
</tr>
</tbody>
</table>

**Overall Quality of Life and job strain**

A second analysis examined overall quality of life and the nine sub-domains of quality of life as a function of Karasek’s psycho-social job types. Table 10 contains the means and standard deviations for overall quality of life and the nine quality of life sub-domains, as a function of the psycho-social job types.
Table 10. Means and standard deviations of overall quality of life, and the nine sub-domains of the quality of life scale as a function of Karasek's psycho-social job types (n=64)

<table>
<thead>
<tr>
<th>QOL Variables</th>
<th>1. Passive jobs (low demand/low control) (n=5)</th>
<th>2. Active jobs (high demand/high control) (n=37)</th>
<th>3. Low strain jobs (low demand/high control) (n=11)</th>
<th>4. High strain (high demand/low control) (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality of Life*</td>
<td>M = 3.56, SD = .36</td>
<td>M = 3.66, SD = .44</td>
<td>M = 3.94, SD = .40</td>
<td>M = 3.30, SD = .44</td>
</tr>
<tr>
<td>Physical being*</td>
<td>4.03, SD = .38</td>
<td>3.75, SD = .62</td>
<td>4.13, SD = .50</td>
<td>3.24, SD = .45</td>
</tr>
<tr>
<td>Psychological being</td>
<td>3.50, SD = .42</td>
<td>3.62, SD = .59</td>
<td>3.65, SD = .65</td>
<td>3.30, SD = .78</td>
</tr>
<tr>
<td>Spiritual being</td>
<td>4.03, SD = .59</td>
<td>3.87, SD = .64</td>
<td>3.98, SD = .55</td>
<td>3.82, SD = .57</td>
</tr>
<tr>
<td>Physical belonging*</td>
<td>3.57, SD = .38</td>
<td>4.07, SD = .52</td>
<td>4.30, SD = .57</td>
<td>3.53, SD = .57</td>
</tr>
<tr>
<td>Social belonging</td>
<td>3.63, SD = .51</td>
<td>3.60, SD = .82</td>
<td>3.91, SD = .59</td>
<td>3.47, SD = .59</td>
</tr>
<tr>
<td>Community belonging*</td>
<td>3.10, SD = .45</td>
<td>3.41, SD = .63</td>
<td>3.99, SD = .59</td>
<td>3.08, SD = .48</td>
</tr>
<tr>
<td>Practical becoming*</td>
<td>3.30, SD = .79</td>
<td>3.49, SD = .56</td>
<td>4.05, SD = .49</td>
<td>3.19, SD = .78</td>
</tr>
<tr>
<td>Leisure becoming</td>
<td>3.33, SD = .26</td>
<td>3.48, SD = .76</td>
<td>3.58, SD = .52</td>
<td>2.89, SD = .85</td>
</tr>
<tr>
<td>Growth becoming*</td>
<td>3.57, SD = .88</td>
<td>3.67, SD = .61</td>
<td>3.89, SD = .51</td>
<td>3.15, SD = .66</td>
</tr>
</tbody>
</table>

Note. * indicates that differences among means = p < .01.

Differences between means on the overall Quality of Life score was significant (F (3, 60) = 4.27, p < .01); multiple comparisons revealed that the high strain group had significantly (p < .05) lower scores on overall quality of life than the low strain or active groups. This finding supports the hypothesis that there is a relationship between the psycho-social job types and overall quality of life.

It lends support to Karasek's model that the interaction of control and demand is as important as the individual measures as outcome predictors.

Quality of Life sub-domains and job strain

Significant differences were found with five of the nine quality of life sub-domains: physical being, physical belonging, community belonging, practical becoming and growth becoming. Differences between means on physical being were significant (F (3, 60) = 5.12, p < .01); the high strain group had significantly lower scores than the other three groups. Differences between...
means on **physical belonging** were significant ($F (3, 60) = 5.42, p < .01$); the high-strain and passive groups had significantly lower scores than the active and low-strain jobs.

Differences between means on **practical becoming** were significant ($F (3, 60) = 4.11, p < .01$); the low-strain group had significantly higher scores than the passive and active jobs. Differences between means on **growth becoming** were significant ($F (3, 60) = 2.86, p < .05$); the high strain group had significantly lower scores than the active group.

**Community belonging and active jobs**
The fifth sub-domain with significantly different means was **community belonging** ($F (3, 60) = 5.23, p < .01$); the “low strain” group had significantly higher scores than the other three groups.

This last analysis was considered worthwhile because part of the Karasek Job Strain model is a learning and motivational diagonal that predicts that people with “active” jobs (high control and high demand) will have a higher participation in socially active leisure and political activities (Karasek and Theorell, 1990). As a point of interest, a particularly high number of the workers at this plant (37 out of 64 subjects) rated themselves as having “active” jobs. Yet the “active” group was not the group that scored the highest on **community belonging**; it was the “low strain” group. This result seems to contradict Karasek’s previous findings that people with active jobs will be more involved with the community.

Table 1 summarizes the findings in hypothesis five and six.
Table 11. Summary of testing of various aspects of hypotheses five and six

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control and overall QOL</td>
<td>yes</td>
</tr>
<tr>
<td>Demand and overall QOL</td>
<td>yes</td>
</tr>
<tr>
<td>Control and physical belonging</td>
<td>yes</td>
</tr>
<tr>
<td>Demand and physical belonging</td>
<td>yes</td>
</tr>
<tr>
<td>Control and community belonging</td>
<td>no</td>
</tr>
<tr>
<td>Demand and community belonging</td>
<td>yes</td>
</tr>
<tr>
<td>Control and growth becoming</td>
<td>yes</td>
</tr>
<tr>
<td>Demand and growth becoming</td>
<td>no</td>
</tr>
<tr>
<td>High strain and overall QOL</td>
<td>yes</td>
</tr>
<tr>
<td>High strain and physical being</td>
<td>yes</td>
</tr>
<tr>
<td>High strain and physical belonging</td>
<td>yes</td>
</tr>
<tr>
<td>High strain and practical becoming</td>
<td>no</td>
</tr>
<tr>
<td>High strain and growth becoming</td>
<td>yes</td>
</tr>
<tr>
<td>Active jobs and community belonging</td>
<td>no</td>
</tr>
</tbody>
</table>

The results from hypotheses five and six suggest that control and demand are predictors of overall quality of life, and in particular, predictors of those aspects of quality of life that are the most related to work. The interaction affect of control and demand — job strain — also seems to be a predictor of overall quality of life and, specifically, to certain job-related aspects of quality of life. But the results from this study do not support Karasek’s theory that people with “active” jobs will be more active in the community.
10.5 Focus on Fairness, Communication and Quality of Life

Hypotheses seven, eight and nine look at the relationship between perceived workplace conditions (fairness and communication), satisfaction with physical health, and quality of life. Pearson product moment correlation coefficients tested these hypotheses. Table 12 contains the correlation matrix among these measures.

Table 12. Correlation matrix between the Fairness measure, the Communication measure, and Satisfaction with physical health and the nine sub-domains of the quality of life measure

(\(n=64\))

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Fairness measure</th>
<th>Communication measure</th>
<th>Satisfaction with physical health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Quality of Life scale</td>
<td>.56**</td>
<td>.57**</td>
<td>.31*</td>
</tr>
<tr>
<td>Physical being</td>
<td>.36**</td>
<td>.45**</td>
<td>.67**</td>
</tr>
<tr>
<td>Psychological being</td>
<td>.32*</td>
<td>.31**</td>
<td>.32**</td>
</tr>
<tr>
<td>Spiritual being</td>
<td>.21</td>
<td>.18</td>
<td>.08</td>
</tr>
<tr>
<td>Physical belonging</td>
<td>.54**</td>
<td>.51**</td>
<td>.23</td>
</tr>
<tr>
<td>Social belonging</td>
<td>.33**</td>
<td>.46**</td>
<td>-.01</td>
</tr>
<tr>
<td>Community belonging</td>
<td>.63**</td>
<td>.56**</td>
<td>.16</td>
</tr>
<tr>
<td>Practical becoming</td>
<td>.50**</td>
<td>.49**</td>
<td>.23</td>
</tr>
<tr>
<td>Leisure becoming</td>
<td>.36**</td>
<td>.33**</td>
<td>.03</td>
</tr>
<tr>
<td>Growth becoming</td>
<td>.34**</td>
<td>.40**</td>
<td>.27*</td>
</tr>
</tbody>
</table>

Note. * \(p < .05\). ** \(p < .01\).
#7: Fairness and QOL scores

**Hypothesis seven** predicted that the Fairness scores would be correlated with the Quality of Life scores.

The Fairness measure is significantly correlated with the overall Quality of Life scale and with eight of the nine quality of life sub-domains.

#8: Communication and QOL scores

**Hypothesis eight** predicted that the Communication scores will be correlated with the Quality of Life scores.

The Communication measure is significantly correlated with the overall Quality of Life scale and with eight of the nine quality of life sub-domains.

10.6 Focus on Health and Gender

#9: Physical health and QOL scores

**Hypothesis nine** predicted that the satisfaction with physical health (physical being question 6) scores will be correlated with the Quality of Life scores.

The satisfaction with physical health score is significantly correlated with the overall Quality of Life scale, but to only three of the nine quality of life sub-domains (physical being, psychological being, and growth becoming.

**Health and high strain jobs**

The focus on health was included because it was felt that people’s satisfaction with their own physical health could possibly be so important that it could influence how people feel about their quality of life to the exclusion of any particular experience of workplace stress. Another reason for isolating this idea of satisfaction with one’s physical health was because so most of the workplace-stress literature has used various manifestations of health as its outcome.

This is especially true for the empirical studies as the outcome measure to Karasek’s Job Strain model, a further analysis using Karasek’s psycho-social job classification tried to tease out the role of health in how
these workers perceived their quality of life. To this end, an analysis of variance looked at specific satisfaction with one’s physical health as a function of the psycho-social job types. The difference between means of the four psycho-social groups on their self-assessment of their health (“How satisfied are you with your health”) was found to be significant ($F(3, 60) = 3.14, p < .05$); workers with high-strain jobs rated their satisfaction with their physical health as significantly lower than those with low-strain jobs. This finding offers support for Karasek’s theory that high-strain jobs lead to ill health.

An analysis of co-variance examined the relationship between Job Strain and quality of life further by controlling for physical health. The relationship between Karasek’s four psycho-social job types and overall Quality of Life continued to be significant ($F(3, 63) = 3.19, p < .05$), even when physical health was controlled for. This indicated that even if Karasek’s four psycho-social job types differed in health, Karasek’s Job Strain still relates to overall Quality of Life. When both physical health and employment grade level (blue- and white-collar) were both controlled for, overall Quality of Life was still significantly determined by the psycho-social job types ($F(3, 60) = 2.90, p < .05$).

The results from hypotheses seven, eight and nine suggest that certain types of workplace stress are predictors of overall quality of life, and satisfaction with one’s physical health is also a predictor of overall quality of life.

#10: Gender, Job Strain, and QOL scores

**Hypothesis ten predicted that women workers would have higher Job Strain scores and lower Quality of Life scores.**

Since gender has received attention in the literature as an important variable in the workplace, it was considered worthwhile to examine the role of gender as a function of both Karasek’s psycho-social job types, employment grade levels, and quality of life scores. Differences in job-related measures divided along lines of gender were tested using analysis of variance. In cases where the $F$-score indicated significant differences, an examination of the means identified the specific differences among the two groups.

The first analysis looked at the relationship between gender (23 women and 41 men) and the control and psychological demand scores. A
A relationship was detected between control and gender. Differences on the Control scores as a function of gender were significant ($F(1, 62) = 6.63, p < .01$); the means of the female scores were significantly lower than the means for males. The level of significance remained at the $p < .01$ level when job classification (blue- and white-collar divides) were controlled for. Differences on the Psychological Demand variable as a function of gender were not significant ($F(1,62) = .77$, ns).

A second analysis looked at gender and the Karasek psycho-social job types (the interaction between control and demand). When the workforce was divided along gender lines, and a chi-square analysis was run with Karasek’s psycho-social job types, only a trend relationship was detected ($\chi^2(3, N=64) = 6.56, p < .1$). Ten women placed themselves into the “active” job category, and seven in the “high strain” category. Table 13 contains the frequencies of male and female workers as a function of Karasek’s psycho-social job classification.

Table 13. *Frequencies of female and male workers as a function of Karasek's psycho-social job types* (n=64)

<table>
<thead>
<tr>
<th>Gender</th>
<th>1. Passive jobs (low demand/low control)</th>
<th>2. Active jobs (high demand/high control)</th>
<th>3. Low strain jobs (low demand/high control)</th>
<th>4. High strain (high demand/low control)</th>
<th>row total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38%</td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>27</td>
<td>8</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>62%</td>
</tr>
<tr>
<td>Column total</td>
<td>5</td>
<td>37</td>
<td>11</td>
<td>11</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>8%</td>
<td>58%</td>
<td>17%</td>
<td>17%</td>
<td>100%</td>
</tr>
</tbody>
</table>

These findings support the studies that have found that female workers experience less control in the workplace. In order to examine Karasek’s prediction that more women will be found in high strain job jobs, a third analysis was done to examine whether the gender stratification into blue- and white-collar workers was significant. When the workforce was divided into blue- and white-collar workers, and a chi-square analysis was
run with the workforce divided along gender lines, the difference between
groups was not significant ($\chi^2 (3, N = 64) = .56$). In this workforce, the
gender divide between blue- and white-collar workers is not significant.
Table 14 contains the frequencies of blue- and white-collar workers as a
function of gender.

Table 14. Frequencies of female and male workers as a function of
blue- and white-collar workers

<table>
<thead>
<tr>
<th>Gender</th>
<th>Job stratification</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blue-collar workers</td>
<td>White-collar workers</td>
<td>row total</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Column total</td>
<td>40</td>
<td>24</td>
<td>64</td>
</tr>
</tbody>
</table>

The fourth analysis on gender examined the relationship between
gender and quality of life. No significant relationship was found between
gender and overall quality of life ($F (1, 62) = 2.70$). This lack of relationship
remained even when job classification (blue- and white-collar divides) was
controlled for. But significant differences were found for gender for three of
the quality of life sub-domains: physical being ($F (1, 62) = 9.15, p < .01$);
psychological being ($F (1, 62) = 11.12, p < .001$); and growth becoming ($F (1,
62) = 4.64, p < .05$). The means for female workers were significantly lower
on these three sub-domains of quality of life than male workers.

Finally, since a large body of the literature on gender in the
workplace has looked at physical health outcomes, the relationship between
gender and “satisfaction with one’s physical health” was explored. There is a
significant relationship ($F (1, 62) = 9.42, p < .01$); female workers have
significantly lower satisfaction ratings with their health than male workers.

The results from hypotheses ten suggest that there is a difference
in the experience of control in the workplace depending on gender. Gender
is a predictor of certain aspects of quality of life, but not of overall quality
of life, and gender is a strong predictor of satisfaction with physical health.
These findings suggest that gender is significant to some extent when examining the relationship between workplace conditions and quality of life, partially supporting previous research that has identified gender as a significant variable in workplace stress.

10.7 Hierarchical Multiple Regression

Earlier the relationship between employment grade level, job, stress, health and quality of life was examined. The purpose of the following analysis was to examine the contributions of each of these variables to the quality of life measure. Use of a hierarchical regression allowed for the systematic examination of the additional contribution of each variable to quality of life.

In the tables that follow, both the beta weights and the standardized beta weights are included. The $F$- and $p$-values refer to the overall regression equation at each step. Significant increases in $R$-squared in each step are identified by asterisks. The $R$-squared used in these tables are the more conservative $R$-squared-adjusted figures provided by the computer programme.

The first variable entered was employment grade level as this was seen as influencing levels of job stress. The various measures of job stress were then entered in order of perceived importance. First, the Karasek measures of control and demand were entered, followed by a variable indicating membership in the high strain group (defined by high demand and low control). The newly designed measures of fairness and communication were entered. Satisfaction with physical health was the final predictor in the equation.

The results of this analysis are presented in Table 15. The first predictor, employment grade level (categorized as blue vs. white-collar workers) did not reliably predict quality of life. However, the Karasek control variable led to a significant increase in predicted variance as did the subsequent addition of the Karasek psychological demand variable. The addition of the fourth predictor, high strain (low control/high demand), did not increase the amount of predicted variance. The analysis also revealed that addition of the fairness measures as well as the communication measure significantly increased the amount of predicted variance. Finally, satisfaction with physical health added additional predicted variance. In total these measures predicted an approximate 47% of observed variance in overall quality of life.
Table 15 contains an overview of the hierarchical regression analysis predicting quality of life.

Table 15. Hierarchical regression analysis predicting quality of life

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>B</th>
<th>R²</th>
<th>ΔR²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Level</td>
<td>.03</td>
<td>.08</td>
<td>.00</td>
<td>.00</td>
<td>&lt;1</td>
<td>ns</td>
</tr>
<tr>
<td>Control</td>
<td>.32</td>
<td>.37</td>
<td>.09</td>
<td>.09**</td>
<td>3.89</td>
<td>.03</td>
</tr>
<tr>
<td>Psychological demand</td>
<td>-.27</td>
<td>-.31</td>
<td>.16</td>
<td>.07*</td>
<td>4.74</td>
<td>.005</td>
</tr>
<tr>
<td>Low control/High demand</td>
<td>.01</td>
<td>.01</td>
<td>.14</td>
<td>-.02</td>
<td>3.50</td>
<td>.013</td>
</tr>
<tr>
<td>Fairness</td>
<td>.26</td>
<td>.50</td>
<td>.27</td>
<td>.13**</td>
<td>5.38</td>
<td>.0004</td>
</tr>
<tr>
<td>Communication</td>
<td>.13</td>
<td>.26</td>
<td>.33</td>
<td>.06*</td>
<td>5.82</td>
<td>.0001</td>
</tr>
<tr>
<td>Physical health</td>
<td>.16</td>
<td>.29</td>
<td>.39</td>
<td>.06*</td>
<td>6.35</td>
<td>.0001</td>
</tr>
</tbody>
</table>

Note. Symbols in the ΔR² column refer to the significance of the increase in predicted variance; * p < .05; ** p < .01.

A similar analysis, but this time controlling for gender was also examined, but, as can be seen in Table 16, gender does not seem to be a major contributing variable in this workplace to quality of life.
Table 16. Hierarchical regression analysis predicting quality of life, controlling for gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>B</th>
<th>R²</th>
<th>ΔR²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>-.20</td>
<td>-.20</td>
<td>.02</td>
<td>.02</td>
<td>2.45</td>
<td>ns</td>
</tr>
<tr>
<td>Job Level</td>
<td>.03</td>
<td>.08</td>
<td>.01</td>
<td>-.01</td>
<td>1.40</td>
<td>ns</td>
</tr>
<tr>
<td>Control</td>
<td>-.02</td>
<td>-.06</td>
<td>.08</td>
<td>.07*</td>
<td>2.73</td>
<td>.06</td>
</tr>
<tr>
<td>Psychological demand</td>
<td>-.28</td>
<td>-.33</td>
<td>.16</td>
<td>.08*</td>
<td>3.87</td>
<td>.007</td>
</tr>
<tr>
<td>Low control/High demand</td>
<td>.01</td>
<td>.02</td>
<td>.15</td>
<td>-.01</td>
<td>3.05</td>
<td>.02</td>
</tr>
<tr>
<td>Fairness</td>
<td>.26</td>
<td>.51</td>
<td>.28</td>
<td>.13**</td>
<td>4.88</td>
<td>.0005</td>
</tr>
<tr>
<td>Communication</td>
<td>.21</td>
<td>.36</td>
<td>.34</td>
<td>.06*</td>
<td>5.28</td>
<td>.0001</td>
</tr>
<tr>
<td>Physical health</td>
<td>.15</td>
<td>.27</td>
<td>.38</td>
<td>.04*</td>
<td>5.50</td>
<td>.0001</td>
</tr>
</tbody>
</table>

Note. Symbols in the ΔR² column refer to the significance of the increase in predicted variance; * p < .05; ** p < .01.

In summary, control, demand, fairness, communication and physical health — but not employment grade level, high strain or gender — are independent contributors to overall quality of life.

Predictors of physical health

A similar sequence of predictors as was carried out for the quality of life variable, was employed. The results of this analysis are presented in Table 17. Job level, control, and job strain all predicted satisfaction with physical health, but only at trend levels. Demand reliably predicted satisfaction with health. Fairness and communication were not independent predictors of satisfaction with health. Table 17 contains an overview of the hierarchical regression analysis predicting satisfaction with physical health.
Table 17. Hierarchical regression analysis predicting satisfaction with physical health

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>B</th>
<th>R²</th>
<th>ΔR²</th>
<th>E</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Level</td>
<td>-.14</td>
<td>-.21</td>
<td>.03</td>
<td>.03+</td>
<td>2.79</td>
<td>.10</td>
</tr>
<tr>
<td>Control</td>
<td>.32</td>
<td>.21</td>
<td>.05</td>
<td>.02+</td>
<td>2.60</td>
<td>.08</td>
</tr>
<tr>
<td>Psychological demand</td>
<td>-.44</td>
<td>-.29</td>
<td>.11</td>
<td>.06*</td>
<td>3.50</td>
<td>.02</td>
</tr>
<tr>
<td>Low control/High demand</td>
<td>-.20</td>
<td>-.22</td>
<td>.14</td>
<td>.03+</td>
<td>3.38</td>
<td>.02</td>
</tr>
<tr>
<td>Fairness</td>
<td>-.05</td>
<td>-.06</td>
<td>.12</td>
<td>-.02</td>
<td>2.69</td>
<td>.03</td>
</tr>
<tr>
<td>Communication</td>
<td>.25</td>
<td>.24</td>
<td>.14</td>
<td>.02</td>
<td>2.60</td>
<td>.03</td>
</tr>
</tbody>
</table>

Note. Symbols in the ΔR² column refer to the significance of the increase in predicted variance; + p < .10; * p < .05.

Table 18 replicates this analysis, but controls for gender. Since there is such a strong relationship between satisfaction with one's physical health and gender, there was a need to control for gender in order to get an idea of how the workplace stress variables predicted satisfaction with one's physical health.

Table 18. Hierarchical regression analysis predicting satisfaction with physical health controlling for gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>B</th>
<th>R²</th>
<th>ΔR²</th>
<th>E</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>-.60</td>
<td>-.35</td>
<td>.11</td>
<td>.11**</td>
<td>8.22</td>
<td>.005</td>
</tr>
<tr>
<td>Job Level</td>
<td>-.14</td>
<td>-.21</td>
<td>.14</td>
<td>.03+</td>
<td>5.75</td>
<td>.005</td>
</tr>
<tr>
<td>Control</td>
<td>.13</td>
<td>.09</td>
<td>.13</td>
<td>-.01</td>
<td>3.92</td>
<td>.01</td>
</tr>
<tr>
<td>Psychological demand</td>
<td>-.52</td>
<td>-.35</td>
<td>.22</td>
<td>.09**</td>
<td>5.22</td>
<td>.001</td>
</tr>
<tr>
<td>Low control/High demand</td>
<td>-.19</td>
<td>-.21</td>
<td>.25</td>
<td>.03</td>
<td>4.84</td>
<td>.001</td>
</tr>
<tr>
<td>Fairness</td>
<td>-.03</td>
<td>-.03</td>
<td>.23</td>
<td>-.02</td>
<td>3.96</td>
<td>.002</td>
</tr>
<tr>
<td>Communication</td>
<td>.21</td>
<td>.21</td>
<td>.24</td>
<td>.01</td>
<td>3.67</td>
<td>.003</td>
</tr>
</tbody>
</table>

Note. Symbols in the ΔR² column refer to the significance of the increase in predicted variance; + p < .10; * p < .05; ** p < .01.

Gender and demand are reliable predictors of satisfaction with physical health, and job level remains as a trend-level predictor. The strain, demand, fairness, and communication measures ability to predict satisfaction with physical health at the trend levels is attenuated once
gender is controlled.
11. Discussion

The main purpose of this thesis was to examine how the structure of the workplace could affect workplace stress, and in turn, spillover into workers' quality of life. In the most part, the results from this study supported the large body of literature that has examined the nature of the workplace hierarchy and its impact on worker stress. This study found that hierarchical divisions influenced how workers experience control and demand in the workplace, but interestingly, these structural divisions, by themselves, did not relate to these workers' perceptions of their overall quality of life.

This discussion section firstly highlights a couple of significant findings from the study that will probably be of the most interest to the participants of the study. It then examines the implications of the results for the study's Workplace-Quality of Life model. It discusses the results as either supportive or non-supportive for the four individual conceptual models used in the research (Karasek's control-demand, Siegrist's effort/reward imbalance, the Yin/Yang communication workplace, and the spillover models). It also includes commentary on this research's implication for health in the workplace, and for women in the workplace.

This section also includes a discussion on the limitations of this research project. It discusses the implications of who did, and who did not, participate in the research project, and the potential impact of the internal workplace politics. It particularly explores how this workplace is different from most workplaces, and how this uniqueness could potentially influence the study's results. Finally, there is some commentary on how this research project could be expanded if the research project had included some qualitative methods.

10.1 Feedback to the company

The author made a commitment to the company to summarize the most interesting findings of this study for the company's newsletter, so that the workers who participated in the study would receive feedback from the study.

Probably the most interesting finding is that it looks as though the blue-collar workers at this company are more satisfied with the
effectiveness of the company's communication than the white-collar workers. Looking at the total communication scale, on a scale from one-to-five, the hourly wage earners had a mean of 3.31 showing satisfaction with management communication, yet the management/engineering group had a mean of 3.01, demonstrating the least satisfaction.

When examining the differences between the answers given by the professional group and the shop-floor workers to particular questions this anomaly became apparent. One question from the fairness measure asked whether workers felt they were fairly rewarded for the effort they put in, and the hourly production workers were significantly more satisfied with how they were rewarded that the professional group. A question within the communications measure asked whether workers felt they received adequate on-going feedback to help improve their performance, and the study found that yet again, the hourly shop-floor workers were significantly more satisfied on this dimension than the professional group.

The newly installed team structure also did not get very high ratings. The hourly wage earners and the management/engineering group are both dissatisfied with the team structure, or the effectiveness of the teams. The executive group also scored low on management's ability to communicate business issues and strategy. On the positive side, both groups expressed satisfaction with the company's ability to communicate externally to meet customers' needs. The management/engineering group also expressed satisfaction with the company's ability to focus on what skills will make them valuable in the future.

There are a number of reasons for the reversal of the expected satisfaction ratings between the executive group and the shop-floor workers. Possible explanations could be found in the exploratory research the author carried out prior to this study when writing the journal article on the company (See Appendix C). This particular worksite is widely recognized for the notable actions it has taken to improve the workplace environment for its shop-floor workers, including excellent health and safety measures, and this has been a definite contributor to this company's worker satisfaction. On the other hand, the company has recently gone through some very rapid expansions, and the professional group could be feeling the brunt of the long hours and high demands that have recently been placed on their shoulders. Another possibility is that this company is run by a family team, and it is feasible that the professional group, with their higher expectations of participation in higher-level decision-making,
could be feeling excluded from the top-level father-and-son executive decision-makers.

10.2 Support for the Workplace-QOL model

The Workplace-Quality of Life model
This thesis is based on a new Workplace-Quality of Life model. The model is a three-layered, trickle-down, concept; workplace hierarchy affects individual workers' experience of stress in the workplace, and in turn, workplace stress spills over into individuals' perceptions of their quality of life.

The model predicts that workplace hierarchy will determine how stressful the workplace is for workers, and that these stressful workplace conditions will in turn affect how workers perceive their quality of life. The model attempts to integrate the existing knowledge on hierarchical workplaces, stress, control, fairness, and effective communication in the workplace, and spillover into the private domain.

The model's concept of workplace hierarchy was measured by using this worksite's employment grade levels. The model's concept of workplace stress was based on three models: Karasek's Job Strain model, the Siegrist effort-reward imbalance model, and the yin/yang communications model. Job Strain was measured with the variables of control and demand, and their interaction variable, job strain. Effort-reward imbalance was operationalized by the Shah Fairness measure. Effective organizational communication was measured using a communications measure that is widely used in the private sector. Workers' perceptions of their quality of life was measured with the Raphael Quality of Life Profile.

Study results
The results of the study offered some support for the model; conditions of workplace stress correlated with quality of life, but interestingly, employment grade level, although a determinant of some indicators of workplace stress, was not a predictor of quality of life.

When examining the first layer of the model, the hierarchical nature of the workplace did not seem as important at this worksite as the model predicted. Although, as expected, the professional group experienced significantly higher control and higher psychological demand than the
hourly shop-floor workers, there were some anomalies. Specifically, no differences were found between these two hierarchical groups when it came to how they experienced overall fairness or overall effectiveness of communication in the workplace. More importantly, no significant differences were found between the hierarchical groups when it came to overall quality of life.

On the other hand, the results of this study strongly supported the models' predicted relationship between workplace stress and quality of life. The study also strongly supported the existing literature that psycho-social factors in the workplace (stress) may have a measurable effect. This study supported the idea that it is possible to measure the effects of workplace stress, not only with health outcomes, but also with measures of overall quality of life.

10.3 Relationship to the conceptual models

The study used four models as the basis for its conceptualization of workplace stress — the Karasek Job Strain model, the Siegrist reward-effort imbalance model, the yin/yang communications model, and a spillover model. Each of the models seemed to have something important to contribute.

Karasek's theory of job strain

The results from this study are supportive of some parts of Karasek's model, but not of others. First, as predicted by the model, blue-collar workers did experience lower control and lower demand than white-collar workers. Secondly, even though a significantly larger number of white-collar workers rated themselves as having "active" jobs, supporting the Karasek model, unexpectedly, a rather low percentage of blue-collar workers rated their jobs as "high strain".

Thirdly, when the relationship between the Karasek measures and quality of life were examined, there was not the predicted relationship between "active" jobs and active leisure, as measured by community involvement. However, there was a relationship between control and demand in the workplace and overall quality of life, as well as with certain quality of life sub-domains identified as specifically related to work. Finally, this study supports Karasek's idea that his model can be used to measure more than just medical disorders.
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UMI
Siegrist’s effort-reward imbalance model and
The yin/yang communications model
Although this study did not use all the dimensions of the Siegrist model (job insecurity and biological information on critical and chronic health effects were not included), this study did find that this model’s psychological concept of workplace fairness added value to its analysis. This study is apparently only the second report showing independent effects of components of these two alternative job stress models — the effort-reward imbalance model and the job strain model. Bosma et al. (1998) were, to the best of their knowledge, the first. The Siegrist model does not make predictions relating to workplace hierarchy, and this study did not find a relationship between perceptions of fairness and workplace hierarchy.

The yin/yang communications model focuses on internal workplace communication, the efficacy of feedback from management, and the effectiveness of leadership. This model does not address a relationship between perceptions of effective communication and the workplace hierarchy, and this study found no overall relationship between perceptions of worksite communication and workplace hierarchy.

It should also be noted that perceptions of fairness and perceptions of effective communication were both strongly correlated to overall quality of life and its sub-domains, and allowed for significant variance to be accounted for when accounting for quality of life.

The spillover model
The spillover model that linked the above models to create the Workplace-Quality of Life model, postulated that work and family life are interdependent and their influence is reciprocal and interactive. It predicted that the psychological and physical well being of family members is affected by the workplace, but that the effect is reciprocal. Stress moves in both directions; there are no clear boundaries or distinctions between the public and the private domain.

The results from this study seem to offer support for the idea that stress in one domain can spill over into the other; that stress in the workplace is related to quality of life. Although this study’s Workplace-QOL model is linear so that it seems that there is a prediction that workplace stress is what is affecting quality of life, it is possible that the direction could be reversed. This study did find that workplace stress had a significant relationship to quality of life, but no direction of causality can be
established. As the spillover model suggests, workplace stress possibly affects the family as much as the family affects workplace stress.

**Gender and Health**

To complete the study, both gender and "satisfaction with one’s physical health" were examined as possibly significant variables influencing both the directionality and causality of the Workplace-QOL model. On the one hand, people’s satisfaction with their own physical health may potentially be so important that it could influence how people feel about their quality of life to the exclusion of any particular experience of workplace stress. Another reason for isolating this idea of satisfaction with one’s physical health was because so much of the workplace-stress literature has used various manifestations of health as its outcome. Gender has also come to be regarded as extremely significant in workplace stress research. It was thought possible that gender role-conflict could be such an over-riding factor that it could influence how women experience stress in the workplace, and how they perceive their quality of life.

Measures examined how satisfaction with one’s physical health related to stress in the workplace, and how it affected quality of life. Satisfaction with one’s physical health was, as predicted, correlated with overall quality of life, and satisfaction with one’s physical health was rated significantly lower by those workers with “high strain” jobs. But when physical health was controlled for, the relationship between workplace stress and quality of life remained.

When gender was examined through the Workplace-QOL model and the study examined whether women were over (or under) represented in either blue- or white-collar work, it was found that this worksite has women at every level of the workplace hierarchy. When women’s experience of workplace stress was examined, in support of the existing literature, it was found that women do feel less control than men in the workplace. There were also differences among men and women in their satisfaction with their physical health; yet there did not seem to be any significant difference between men and women in their experience of overall quality of life. Why this should be the case, is unclear.
10.4 Implications for Causality

The cross-sectional correlational nature of this study’s design precludes notions of causality. On the one hand, this study offers some support for the idea that workplace stress is related to people’s differing jobs within the workplace hierarchy since certain aspects of workplace stress is experienced differently by shop-floor workers and professionals. This study also supported the idea that there could be a carry-over effect from the workplace to the private domain of home and leisure, and that stress experienced at work does have an impact on overall quality of life. On the other hand, the results from this study do not preclude the idea that the causality could be working in the opposite direction, and, as mentioned, satisfaction with one’s quality of life could be what is influencing workplace perceptions of stress.

Another area of contested causality would be whether workplace hierarchy is an important variable at all. The workplace hierarchy at this worksite certainly behaved as Karasek predicted it would on the dimensions of control, psychological demand and Job Strain. But it is much more difficult to establish a causal relationship between workplace hierarchy and the more distal effect of quality of life. It would take a much larger, and more complex study than was carried out to isolate whether hierarchical difference in the workplace have an effect on quality of life. It could as easily be argued that since society at large is hierarchical and class oriented, the hierarchy in the workplace is just a reflection of more systemic class differences, and so the relationship between Job Strain and workplace hierarchy is just a spurious relationship.

Implications for health
Expanding upon the literature linking different health outcomes to workplace stress, this study has not only found suggestions of links between workplace stress and workers’ satisfaction with their personal health, but also to their overall quality of life.

The results of the study emphasize the need for workers to have increased control over their work. There is now a significant body of literature that firmly shows that a lack of control is strongly related to stress, strain and health outcomes. The close connection between quality of life and the need for individuals to feel control over their work is probably
one of the most important features of this study. This study and the accumulating literature on the subject, calls for an in-depth examination of how work is structured to allow for individual workers to be in control of their daily work functioning.

Implications of the uniqueness of the site
This plant initially came to the author’s attention because it had been acknowledged by its peers as a company with an excellent reputation. This company had received a number of awards for its productivity, innovation, quality, and research and development. More relevant to this research, it also had the reputation of being very concerned about worker welfare, worker health and safety, and worker involvement in decision-making through team work. The company had never laid off any workers, had a low absenteeism rate, and at the time of this study, had a very low turn-over rate. Although the company has been in rapid expansion-mode for the last five years (a year after this research was initiated it grew from 173 to 250 workers), it still runs very much as a family business with a father-and-son top-executive team in control most of the essential decisions.

These are just some of the characteristics of this plant that make this company unique and may impact on the generalizability of the results. (For a more expansive profile of the company, see Appendix C).

This plant’s philosophy of employee empowerment on the shop floor is probably creating more satisfied workers than is normal. It was hypothesized that there would be a more pronounced hierarchical differences between the executives and the shop-floor workers. But this was not found to be true at this plant. This could also be an affect of the company philosophy. Another thought is that, if these differences were as clearly pronounced as in most other manufacturing plants, then perhaps this research would have found a stronger connection and relationship between hierarchy and quality of life.

The strong father-and-son team is probably both a strength of the company as well as a weakness. The strongest strength is that the workers seem to respond well to the family atmosphere of the company, which would, in turn, affect their perceptions of their quality of working life. But, as discussed, the closeness of this top executive team may be excluding input and participation of the engineers and managers, leading to some dissatisfaction within this group. Such a concentration of centralized power
also means that increasing responsibility falls on too few shoulders. This can become a problem especially as the plant continues to expand. It may be one of the reasons why the management group does not feel it is receiving adequate feedback.

Despite the fact that this plant could be seen as unique, the similarities to other manufacturing companies did come through in the results of this study. In support of the vast and growing body of literature, this research did find that executives experience more control and less psychological demand than shop-floor workers, and this has an effect on worker perceptions of stress. It also found, as expected, that those workers who experience less control and more psychological demand do have lower perceptions of quality of life. And finally, it did find that perceptions of fairness and effective communication in the workplace, also affected perceptions of quality of life.

Effect of internal politics
There was a lack of representativeness in the sample. Only 64 out of a potential 173 employees participated in this study; only 40 out of a potential 130 shop-floor production workers participated, and only 24 out of a potential 43 salaried staff participated. The internal politics of the company could have had an impact on the sampling. This is a cause for concern.

There could be a number of reasons why workers did not feel they could participate. Although they were reassured at the all-staff meeting that their answers would be kept in strict confidence and their identity would be anonymous, since this commitment came from the executives, it may not have had the equivalent weight of reassurance from a union representative.

This is a non-unionized plant, and the “route in” to the plant was through top management. Only the executive staff were consulted to gain their permission for the research to be conducted. There was no way to approach the workers through a union structure, or, as an alternative approach, through the health and safety committee. This had the effect of potentially “tainting” the research with the air of being sponsored by the executives and could have been perceived as irrelevant to the shop-floor workers.

The questionnaire was also only printed in English. This would have excluded those workers who do not have English as their native language, or
who did not have a high standard of literacy from participating. In future research, the language barrier could be somewhat overcome if the questionnaire is translated into the different native languages of the workers.

Need for further research

This study has its limitations. The sample size was small, the study was based on only one workplace, and it was executed at only one point in time. The cross-sectional nature of this study precludes the identification of causality. From these results it is impossible to say whether it is workplace stress that affects quality of life, or whether quality of life is predicting workplace perceptions of stress. The study would be improved, and possible predictions of causality would be more feasible, if a similar longitudinal study was administered, so that stress in the workplace, as well as stress generated in the private sphere, could be monitored over time.

Future research would ideally also use much larger sample sizes in a broader range of workplace environments, so that comparisons could be made between equivalent workplaces with different management structures and cultures. This would lend weight to the research results and allow the results greater generalizability.

Finally, the quality of the data from the research could have been improved if some qualitative methods had been used. In-depth interviews with workers, follow-up interviews with the executives (interviews were conducted with seven executive members as part of the initial research which informed the journal article (See Appendix C)), and focus groups with the workers would have theoretically allowed for more rigorous, accurate, dense, rich, and saturated data.
QUALITY OF WORKING LIFE
EMPLOYEE QUESTIONNAIRE

CURRENT FIELD VERSION
University of Toronto

(APRIL 1998)

* * * * * * * * * * * * * * * * * * * * * * * * * * * * *

Please take a few minutes to fill out this questionnaire. Your answers will help your company plan to help improve your health and well-being.
WHAT THIS SURVEY IS ABOUT

************************************************

Your work can affect your health. Most Canadians spend more than one-third of their life at work. It is important that this time is spend productively and in a way that contributes to overall quality of life.

This questionnaire is looking at three different things. It is looking at how satisfied you are with your quality of life. It is looking at the amount of control you feel you have in your workplace, and it is also asking for some very basic information about yourself.

Your answers will be anonymous and kept in strict confidence. Do not put your name on this questionnaire. Once you fill it out and seal it in its envelope, it will never be seen by anyone at Polywheels. Instead, the University of Toronto will count up the results and report to the President of Polywheels and the Workplace Health Committee on the overall health needs and concerns of the employees as a group.

INSTRUCTIONS

************************************************

* Please read each question carefully and answer as accurately as you can with reference to your own specific job and life. Please answer each question by checking off the one answer that best fits your job situation. Sometimes none of the answers fit exactly, but please try to make sure you answer every question, so please choose the answer that comes closest.

* Do not put your name on this questionnaire. Your answers are completely anonymous and confidential.

* Use a pencil so you can erase any answer you want to change.

* When you are finished, seal your completed questionnaire in the attached envelope.
QUALITY OF WORKING LIFE

What is Quality of Life?

Quality of Life, in simple terms, means:

"How good is your life for you?"

The answer to this question is a measure of a person's Quality of Life.

To answer the question "How good is your life for you?" you are asked to focus on yourself and to rate some aspects of your life. These are all rated on a simple scale of 1 to 5. The aspects of your life are divided evenly into nine areas — areas that we think are part of the lives of all people.

The nine areas that are part of the lives of all people are:

1. My body and my health
2. My thoughts and feelings
3. My beliefs and values
4. Where I live and spend my time
5. The people around me
6. My access to things
7. My daily activities
8. What I do for enjoyment
9. What I do to improve or change

You will be rating these aspects of your life to how satisfied you are with this part of my life. Then you will be answering a few questions on the kind of work you do, the demands the work makes on you, making decisions, and your feelings about your health and your job. This sounds like a lot, but you will find that you can rate them rather quickly.

Please complete your ratings as honestly as you can.
I. **Satisfaction**

**Instructions:**

1. The first question to ask yourself is:

   *How satisfied am I with this part of my life?*

   If you need to think about the question another way, try:

   *How happy am I with this aspect of my life?*

2. Rate each of the items from 1 to 5, using the rating scale at the top of the following pages. Rate items 5 if you are extremely satisfied with this part of your life; rate items 3 if you think you are feeling moderately satisfied with this aspect of your life; rate items 1 if you are not at all satisfied.

   **Note:** You may score N/A for Not Applicable, or DK for Don’t Know.
Rating scale:

NOT AT ALL  NOT VERY  SOMewhat  VERY  EXTREMELY

1       2       3       4       5

How satisfied am I with --?

My body and my health:
1. My physical ability to get around
2. My appearance - how I look
3. My exercising and being fit
4. My hygiene - caring for myself
5. My nutrition and the food I eat
6. My physical health

My thoughts and feelings:
7. How accepting I am of myself
8. How free I am of worry and stress
9. How I feel about myself
10. My mental health
11. The mood I am usually in
12. How independently I think and act

My beliefs and values:
13. How I celebrate special events in my life
14. Feeling that life has meaning
15. My hope for the future
16. My religious or spiritual beliefs
17. My helping of others
18. My ideas of right and wrong
Rating scale:

NOT AT ALL  NOT VERY  SOMewhat  VERY  EXTREMELY
1  2  3  4  5

How satisfied am I with -- ?

Where I live and spend my time:

19. How safe I feel in my home
20. How safe I feel when I go out
21. The area of the country I live in
22. The house or apartment I live in
23. The neighbourhood I live in
24. The things that I own

The people around me:

25. How close I am to people in my family
26. The cultural/interest/faith groups I belong to
27. My acquaintances
28. My spouse or special person
29. The social events I attend
30. The friends I have

My access to things:

31. My ability to get professional services (medical, social, etc.)
32. The education I have
33. The amount of money I have
34. The events in my community I go to (movies, shows, fairs, etc.)
35. The places I go to in my community (stores, restaurants, etc.)
36. The work I do
Rating scale:

<table>
<thead>
<tr>
<th>NOT AT ALL</th>
<th>NOT VERY</th>
<th>SOMEWHAT</th>
<th>VERY</th>
<th>EXTREMELY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

How satisfied am I with --?

The daily things I do:

37. The things I do around my home
38. The volunteer work I do for others
39. The appointments I go to (medical, social services, etc.)
40. My looking after my appearance and hygiene
41. My looking after other people or pets
42. The work I do at a job or school

The things I do for enjoyment:

43. The public entertainment I attend
44. My hobbies and interests
45. My vacation and holiday activities
46. My indoor activities (TV, reading, etc.)
47. My outdoor activities (walks, cycling, etc.)
48. The visiting and spending time with others I do

The things I do to improve and change:

49. My ability to cope with changes in my life
50. My getting along with others
51. My improving my physical health and fitness
52. My learning about new things
53. My solving of my problems
54. My trying out new things
2. **Job Content**

**Instructions:**

1. The second question to ask yourself is:

   *How does this *best fit* my job situation?*

2. Rate each of the items from 1 to 4, using the rating scale at the top of the following pages. Please make sure you answer the questions correctly. Rate items 1 if you strongly disagree with the statement; rate items 2 if you disagree with the statement; rate items 3 if you agree; and rate items 4 if you strongly agree with the statement.

   Note: You may score N/A for Not Applicable, or DK for Don’t Know.
Rating scale:

[Diagram showing a rating scale with four levels: Disagree strongly (1), Disagree (2), Agree (3), Agree strongly (4)]

How well does each statement best fit my job situation?

1. My job requires that I learn new things
2. My job involves a lot of repetitive work
3. My job requires me to be creative
4. My job allows me to make a lot of decisions on my own
5. My job requires a high level of skill
6. On my job, I have very little freedom to decide how I do my work
7. I get to do a variety of different things on my job
8. I have a lot to say about what happens on my job
9. I have an opportunity to develop my own special abilities
10. My job requires working very fast
11. My job requires working very hard
12. My job requires lots of physical effort
Rating scale:

<table>
<thead>
<tr>
<th>DISAGREE STRONGLY</th>
<th>DISAGREE</th>
<th>AGREE</th>
<th>AGREE STRONGLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

13. I am not asked to do an excessive amount of work
14. I have enough time to get the job done
15. I am often required to move or lift very heavy loads on my job
16. My work requires rapid and continuous physical activity
17. I am free from conflicting demands that others make
18. My job requires long periods of intense concentration on the task

19. My tasks are often interrupted before they can be completed, requiring attention at a later time
20. My job is very hectic
21. I am often required to work for long periods with my body in physically awkward positions
22. I am required to work for long periods with my head or arms in physically awkward positions
23. Waiting on work from other people or departments often slows me down on my job
3. **Feelings about my job**

**Instructions:**

1. The third question to ask yourself is:

   How do I *feel* about the following statements.

2. Please make sure that you answer these questions correctly. Rate each of the items from 1 to 5, using the rating scale at the top of the following page. Rate items 1 if you strongly disagree with the statement; rate items 2 if you disagree with the statement; rate items 3 if you are not sure; rate items 4 if you agree; and rate items 5 if you strongly agree with the statement.
Rating scale:

[Diagram with bars labeled DISAGREE, DISAGREE STRONGLY, NOT SURE, AGREE, AGREE STRONGLY, numbered 1 to 5]

How well does each statement describe how I feel about my job situation - - ?

1. I have an influence over the things that happen to me at work
2. I am satisfied with the recognition I receive from my employer for doing a good job
3. I am satisfied with the amount of involvement I have in decisions that affect my work
4. I am satisfied with the fairness and respect I receive on the job
5. I feel I am well rewarded for the level of effort I put out for my job
6. I get as much out of my job as I put into it
4. **Your background**

In order to make sense of the information you have given us so far, we need to ask a few personal questions. Your answers will help us figure out the needs of different groups. Please remember, though, that no one will use this information to identify you.

Thank you so much for going to all this trouble to answer these questions.

1. **How old are you?**
   - 01 □ Under 20
   - 02 □ 20-29
   - 03 □ 30-39
   - 04 □ 40-49
   - 05 □ 50-59
   - 06 □ 60 or over

2. **What is your marital status right now?**
   - 01 □ single/never married
   - 02 □ married
   - 03 □ widowed
   - 04 □ separated
   - 05 □ divorced
   - 06 □ living with someone

3. **What is your gender?**
   - 01 □ male
   - 02 □ female

4. **How long have you been with Polywheels?**
   - 01 □ less than 1 year
   - 02 □ 1-4 years
   - 03 □ 5-9 years
   - 04 □ 10 to 14 years
   - 05 □ 15 or more years

5. **What is your level of education?**
   - 01 □ Some elementary school
   - 02 □ Finished elementary school
   - 03 □ Went to high school but did not finish
   - 04 □ Finished high school
   - 05 □ Went to community college but did not finish
   - 06 □ Finished community college
   - 07 □ Went to university but did not finish
   - 08 □ Finished university
   - 09 □ Went to graduate school but did not finish
   - 10 □ Finished graduate school

6. **Do you have children or elderly parents for whom you are responsible (i.e. live with you, or you have to spend time looking after them)?**
   - 01 □ Yes
   - 02 □ No

7. **What type of job do you have?**
   - 01 □ production employees — hourly
   - 02 □ production employees — salary
   - 03 □ administrative — office
   - 04 □ management, engineering and executive
5. **Health and Job Satisfaction**

**Instructions:**

1. The fourth question to ask yourself is:

   **How strongly do I agree or disagree with each of these statements?**

2. Please make sure that you answer these questions correctly. Rate each of the items from 1 to 5, using the rating scale at the top of the following page. Rate items 1 if you strongly disagree with the statement; rate items 2 if you disagree with the statement; rate items 3 if you are not sure; rate items 4 if you agree; and rate items 5 if you strongly agree with the statement.
Rating scale:

1. I have enough information to do my job well.
2. I can see a clear link between my work and my company's objectives.
3. I feel encouraged to come up with new and better ways of doing things.
4. My job makes good use of my skills and abilities.
5. I know what skills I will need in the future to be a valuable contributor in my company.
6. My company is making the changes necessary to compete effectively.
7. I understand what my organization must do to meet or exceed our customers' needs.
8. My team gets the cooperation it needs from other work groups to achieve our business objectives.
9. I receive on-going feedback that helps me improve my performance.
10. My company's senior management does a good job of communicating business issues, strategies and results.
May 4, 1998

Dr. D. Raphael  
Dept. of Public Health Sciences  
Faculty of Medicine  
12 Queen’s Park Crescent West  
University of Toronto

Dear Dr. Raphael:

Re: “Examination of the spillover effect of control/demand to overall quality of life” by Dr. D. Raphael, D. Krarner

We are writing to advise you that a Review Committee composed of Professors R. MacFadden, A. H. Khan, Drs. M. Goodstadt and I. Rootman has granted approval to the above-named research study.

The approved revised information sheet and consent form are attached. Subjects should receive a copy of their consent form. Note: To protect confidentiality, all workers should be asked to take a questionnaire, whether they return it or not.

During the course of the research, any significant deviations from the approved protocol (that is, any deviation which would lead to an increase in risk or a decrease in benefit to human subjects) and/or any unanticipated developments within the research should be brought to the attention of the Office of Research Services.

Best wishes for the successful completion of your project.

Yours sincerely,

Susan Pilon  
Executive Officer  
Human Subjects Review Committee

SP/mr Enclosures  
cc: Prof. H. Skinner, D. Kramer
CONSENT FORM

I understand that this study is trying to find out the relationship between work and well-being.

I understand that the study is being carried out by Dee Kramer, a student from the Department of Public Health Sciences at the University of Toronto. The study is part of her Masters thesis; her supervisor is Dr. Dennis Raphael.

I understand that if I agree to participate in the study, I will be asked about the quality of my life in general, some questions on my work, and some general questions about myself. The questionnaire is looking at how work can affect the way you feel about your whole life. The questionnaire should take about 30 minutes to fill out.

I understand that if I decide to participate in the study I do not have to answer any questions that I do not wish to answer. The information I provide in the study will be confidential and my name will not appear in any report of the study. I understand that participation will have no impact on my employment.

I understand that the decision to participate in the study is my own and that there are no direct/tangible benefits to me for participating other than personal satisfaction. However, the information I provide is a chance for me to put down my ideas on what I think is important about work and how it can be made better.

I understand that if I agree to participate in this study, I will receive a copy of the information letter. The summary of the findings of the study will be printed in an issue of the company newsletter, Polywheels News.

I consent to participate in this study.

______________________________  ______________________________
Date                               Signature
Dee Kramer, a student from the University of Toronto, will be coming to Polywheels, to ask everyone at Polywheels to fill out a questionnaire. The questionnaire will take about a half-hour to fill out.

The questionnaire looks at how you feel about your work, and how this can influence the way you feel about your whole life. This is a chance for you to put down your ideas on what you think is important about work, and how it affects the rest of your life.

No one puts their name on their questionnaire, so everyone's answer is strictly confidential. Your answers will be put into a blank, sealed envelope so there is no way that anyone can know who filled out what questionnaire.

Only a summary of all of the questionnaires will be known. No one has to fill out the questionnaire if they do not want to -- it is completely voluntary -- but the more people who do, the better the results will be.

Frank Milligan,
President and CEO
INFORMATION LETTER FOR POLYWHEELS' EMPLOYEES

This study is trying to find out the relationship between work and well-being. It is being carried out by Dee Kramer, a student from the Department of Public Health Sciences at the University of Toronto, as part of her Masters thesis.

If you agree to participate in the study, you will be asked about your life in general, some questions on your work, and some general questions about yourself. The questionnaire is looking at how work can affect the way you feel about your whole life. The questionnaire should take about 30 minutes to fill out.

This study has the support of management. Participation will have no impact on your employment. You do not have to answer any questions that you do not wish to answer. The information you provide in the study will be confidential and your name will not appear in any report of the study.

Unfortunately we are not able to pay you. Your decision to participate in the study is your own and there are no direct/tangible benefits to you for participating other than personal satisfaction. However, we believe you will learn a bit about yourself, and believe this is a chance for you to put down your ideas on what you think is important about work and how it can be made better for you.

If you agree to participate in this study, you will receive a copy of this information letter and will fill out a consent form. A summary of the findings of the study will be published in the company newsletter, Polywheels News.

If you have any questions, please feel free to contact Dee Kramer at (416) 467-6272.
Appendix C

Company X: A profile
Company X was selected for this study because it is an exemplar of excellence. It has focused on quality assurance, benchmarking against other world-class companies, research and development, and an investment in their workers. It is a privately-held, non-unionized company. This author made initial contact with the company in her role as a journalist to write a profile of the company for an engineering magazine. This initial entree facilitated her subsequent access as a researcher.

Most of the following company profile was researched and written as a journal article in 1987, and subsequently published in *Plant Engineering and Maintenance*, 22(2), April, 1988, pp32-35. It includes quotes from a number of company officials, but no workers.

The company, which is located in southern Ontario, was incorporated in 1986 by the company’s president, and his son. It manufactures injection molded automotive parts, such as fuel tank heat shields, header panels, fuel filler supports and skid plates for the major automotive manufacturers and aftermarket car parts distributors. The company has also developed various consumer products including microwave oven trays, bathroom sinks, outboard motor covers, and snowboards.

Annual sales for 1997 were in excess of $30 million and predicted sales for the end of 1998, are double that. By the year 2001, the company expects to reach the $100 million mark. Their scrap rates have dropped from three percent to just over two percent in the last four years. There have been three rejected parts from over eight million shipped. Over the past four years there has been upwards of 25 percent reduction in production costs. Prices have held the line over this same time period.

The first step on the road to excellence was putting in place management and quality systems. In 1991, the company adopted Ford’s Q-101 Quality system as their own quality program. Ford represents in excess of 60 percent of their business, and the company is now a “preferred supplier” to Ford.

When it comes to strategic management and quality control, the company uses problem solving techniques, action plans, and SPC (Statistical Process Control from W. Edwards Deming, one of the original management gurus).
The company director's leadership of his staff (130 hourly and 45 salaried) is low key. "I lead by example. Most of the people know me and I'm on the floor as much as I can. The only complaint is that I am not out there often enough." He agrees with Deming's philosophy of management, and believes in trusting his staff and giving them responsibility. "Most people want to do a good job and take a pride in their work. If you create the right atmosphere, and give them the tools, they take the responsibility of doing a good job. I like to know they like me and trust me. I believe in working hard and having fun. I tell my people all the time, if you can't have fun it will kill you. This is just a big chess game, and you have to like the work you are doing."

In 1993, The company was courted by a U.S. company to move down to Tennessee and Indiana. The offer came with a tremendous economic incentive, but the company director turned it down. "I couldn't do it. I felt responsible for the people who work here, and I couldn't take all 90 with me." Instead, the offer of a new location "fell into their laps", and the significantly larger size of the new location facilitated the company's expansion.

The vice-president of finance sees one of the strengths of the company as its ability to react quickly. "Our management group is still small enough that it is not encumbered by a lot of bureaucracy. We continue to have the philosophy of a family-operated company."

The company invests in their workers. Training is given a high priority. Employee evaluations are based on experience, skills and team evaluations. There are employee and team award recognitions, an annual barbecue, and a Christmas lunch with employees and their families. Benefit programs keep pace, and exceed the norms of the market. "We treat people here like people. We try to blur the line between management and those on the shop floor," the company director said. In the history of the company, there have been no layoffs. Robots and automation are added to coordinate with business expansion so that displaced workers are reassigned to new positions.

The company takes a proactive approach to problem-solving by encouraging employees to be innovative and take risks. The workers on the production line work in self-directed teams, and get involved with production changes by identifying improvements in work flow and production methods. The engineers and design teams do the basic layout and then the shop floor gets involved. Fourteen percent of the company's
profits goes into R & D, design, and product testing.

Cross-functional teams work towards reducing inter-departmental rivalry — “I don’t expect everyone to like each other all of the time, but it is necessary that there be respect,” says the company director. He is not satisfied with the functioning of these teams and has delegated a steering committee to look into defining a new mandate for these teams.

The company has lower turnover and absenteeism rates as well as a better safety record than others in the industry. (Over the last four years, there have been 11 lost-time accidents, none of them serious; a 2.18 percent absenteeism rate; and a 1.19 percent turnover rate.) The monthly reports from the Health and Safety committee are acted on. The presses in the plants have state-of-the-art safety controls. Press operators have the responsibility to shut down malfunctioning machines. “I would criticize them for not shutting a machine down,” says the company director.

There is a focus on sharing improvement goals and disseminating information on quality throughout the organization. “Communication is the key,” says the company director. “It is the most important ingredient and the toughest to perfect. Communication is what holds it all together and we have to work on it all the time.”

This commitment to excellence has been recognized by the company’s peers. They were the first Canadian company to achieve QS-9000 registration, an ISO 9000-based system specific to the automotive industry. In 1994, The company received the Preferred Quality Award from Ford Canada — an award for excellence. The same year, the company was recognized by Arthur Anderson as one of the 50 best-managed private companies.

More recently, The company has been awarded a Certificate of Merit in the 1996 Canada Awards for Excellence in Quality from the National Quality Institute. They are ISO 9001 certified, and were one of the first companies in Canada to be ISO 14001 certified (the environmental management certification). The company continues to benchmark themselves, and will again be going after the Canadian Awards for Excellence and the Arthur Anderson 50 Best Companies in 1998.

The company director is quite laid back about these achievements. It is the process of benchmarking that he sees as more important than the awards. It is the processes of pitting his company against other companies of excellence that is important to him. “It’s a way to check yourself, and keep making sure you come first.”
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