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THE EFFECTS OF SENSE OF COHERENCE  
ON WORK STRESSORS AND OUTCOMES IN BLUE COLLAR WORKERS

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## DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Industrial and Organizational Psychology. It has not been submitted before for a degree or examination in any other University.

Signed by candidate

G M ANSTEY

June, 1989

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**LIST OF ABBREVIATIONS**

SOC	Sense of Coherence
GRRs	Generalized Resistance Resources
GRDs	Generalized Resistance Deficits
SRRs	Specific Resistance Resources
NA	Negative Affectivity
IHD	Ischaemic Heart Disease
JDL	Job Decision Latitude
PDM	Participation in Decision Making

## ABSTRACT

The present study investigated the relationships between work stressors, three moderator variables, and a variety of affective, behavioural and health outcomes. More specifically, it was hypothesized that the work stressors would be significantly associated with adverse affective, behavioural and health outcomes. Furthermore, it was hypothesized that personal and situational variables, in the form of the Sense of Coherence (Antonovsky, 1979, 1987), Job Decision Latitude (Karasek, 1979), and Participation in Decision Making, would moderate the relationships between work stressors and a variety of outcomes. The data were obtained from a sample of 111 male, white, blue collar workers at a large chemicals manufacturing organization from a questionnaire compiled for this study, and organizational records. The data were subjected to correlational analysis, supplemented by a form of moderated multiple regression analysis. It was found that the relationships between work stressors and outcome variables were insignificant which led to the conclusions that firstly, a priori specification of stressors may ignore the specificity of persons' appraisals of and responses to stressors, and secondly, consideration must be given to the affective meaning ascribed by subjects to job demands. The moderating effects of the Sense of Coherence, Job Decision Latitude and Participation in Decision Making were inconsistently related to outcome variables, frequently operating in the unexpected direction. It was, however,

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demonstrated that the main effects of the moderating variables which operated in the expected direction, outweighed the unanticipated negative interaction effects. It was observed that the inclusion of personality variables and situational variables in future studies of occupational stress are necessary, a conclusion which is consistent with more recent findings.

# CHAPTER 1

## INTRODUCTION

Occupational stress has become an increasingly popular field of study within organizational psychology. Cannon (1914) first used the term "stress" to describe emotional states that had physical consequences on organisms. Selye (1956) in The Stress of Life, defined stress as the nonspecific response of the body to any demand and developed the concept of the general adaptation syndrome. According to Beehr and Franz (1986), stress at the time was equated with "nervous strain" and implied a psychological rather than a physical state. More recently, however, there have been an enormous range of studies which bear witness to the complexity of the phenomenon.

Beehr and Franz (1986) have identified four approaches from which these studies are derived: the medical approach which operationalizes physical stressors and relates these to physical outcomes, the clinical psychology approach which operationalizes psychological stressors and relates these to psychological strains outcomes, the engineering psychology approach which operationalizes physical stressors and relates these to job performance outcomes, and the organizational psychology approach which operationalizes psychological stressors and relates these to psychological strain outcomes. While the typical primary target of treatment in the clinical psychology approach is the individual, the organizational psychology approach typically targets the organization.

Organizational psychologists have focussed upon psychological stressors in the working environment (for example, role conflict, role ambiguity and quantitative workload); cognitive, affective and behavioural outcomes for individuals and organizations (job involvement, job satisfaction, task performance and productivity); upon coping processes; upon health outcomes (coronary heart disease, and psychosomatic symptoms); and moderators of all or some of the links (social support, personality characteristics, and situational characteristics).

Coyne and Lazarus (1980) have urged researchers to adopt a transactional perspective for the study of stress. This approach goes beyond the level of interaction where "thing is balanced against thing in causal interaction" (p. 145). It also supersedes the approach of laboratory studies which are restrictive in terms of the information they yield regarding sources of stress and the resources people draw on; nor do they capture time or approximate the stresses of every day life; and they provide illusory control and have limited external validity (Coyne & Lazarus, 1980).

Consequently, as conceptions of causality have been influenced by systems theory, simple and linear relationships are recognized as inadequate explanations of what is observed and encountered in applied organizational settings. Raubenheimer believed that general system theory "comprises a breadth of vision which makes provision for integration of knowledge in a wide variety of fields" (1981, p.4)

Complexity, difference and change are being captured through multidimensional constructs and process models. The field is becoming more complex and differentiated. Seemingly obvious assumptions, such as the centrality of work assumption, have been challenged (Kasl, 1978). As insights from more elaborated formulations regarding coping (Jackson & Maslach, 1982), interactions between work and non-work areas (Greenhaus & Beutell, 1985), career stages and life stages (Shaffer, 1987), and life events (Sarason & Johnson, 1979), to name but a few, find expression in the literature, so have they influenced occupational stress theory and research.

### **BACKGROUND TO THE PROBLEM**

This section considers two broad aspects: the lack of research into blue collar stress in South Africa, and the issue of moderators of the stress-strain relationship.

#### **Lack of Research**

Shostak (1985) has identified three specific sources of blue collar alienation in the work place:

- \* anxieties about health and safety
- \* compensation which hardly keeps pace with inflation
- \* the fear of job loss, a perception grounded in concentration of wealth (and in the case of South Africa, the political economy, sanctions and disinvestment).

There is a paucity of research into blue collar stress in South Africa. A literature survey revealed a few articles on executive and middle management stress, stress amongst industrial relations practitioners, clerical workers and workers in the gold mines, and stress experienced by health care workers and detainees. This is surprising given the data emerging from Europe and North America regarding health and morbidity rates of blue collar workers. Cooper and Smith (1985, p. 1) observed that: "in terms of almost all of the major and many of the minor causes of death among persons in the working population age group, the blue collar and the unskilled are at greater risk than the white collar and professionals".

MacLeod (1985) cited three reasons for concern regarding stress at work:

- \* the need to improve productivity in the face of more competition;
- \* the fact that stress has a deleterious impact upon performance; and
- \* that occupational health is associated with sharply rising health care costs.

A fourth reason may be that as organizations' cultures are managed, the Quality of Working Life movement directs attention to the "problems of dissatisfaction and powerlessness that accompany economic development" (Delamotte & Takesewa, quoted by Evans, 1984, p. 351).

### Moderators

A common criticism of much occupational stress research is the nature of designs which rely on self-reported measures. House, Wells, Landerman, McMichael and Kaplan (1979) found that subjective measures were better predictors of stress than objective measures. Payne, Jick and Burke (1982) concluded that this could be interpreted to mean that those people who are more strained will tend to see the world as more pressing, irrespective of objective conditions. In a similar vein, Kobasa criticized self-reported measures of ill-health and declared that "an investigator is only measuring a person's indication to play the role of a sick person" (1982, p.24). Brief and Atieh have noted problems of this sort and concluded that it "may not be the job conditions per se that are producing the job stress but rather a stable personality trait is influencing both self reports of job conditions and distress" (1987, p. 122).

Thus, in a sense, a very real problem in occupational stress is what, in fact, accounts for the different perceptions of stressors and reported distress of subjects. The multiplicity of independent variables and dependent variables in the literature and in the theories often seem interchangeable and the equivocal findings can bewilder and beguile the student. The large proportion of unexplained variance accounted for by independent variables suggests that there may well be moderator variables operating. The issue of unexplained variance attributed to non-specified moderators also emerges from the meta-analytic studies of Fisher and Gitelson (1983) and Jackson and Schuler (1985).

Social support, to be discussed below, has been one of the most topical and researched moderators. The comments about complexity and the need for more differentiation in theories applies to social support since many inconsistent findings on the buffering effects of social support exist. Thus the questions the researcher could be asking could focus less on the content of the issue than the process. Put another way, perhaps the perceptions of stressors and outcomes may be as important as is the question: "What makes the difference?" What is it that influences perceptions of stressors and outcomes?

House (1987) has commented on the relatively stable and enduring characteristics of the person or the situation in trying to implicate stressors with health or organizational outcomes. He noted that anger, Type A behaviour pattern and lack of social ties represent stable attributes or characteristics of the person. Whereas Type A behaviour and anger disposition have been found to relate to significant morbidity and mortality from cardiovascular disease and other diseases, "chronic stress and satisfaction variables have proved relatively non-predictive of cardiovascular disease and other diseases" (House, 1987, p. 132). Kasl, too, has urged researchers to make use of a strategy of "searching for possible modifying effects of various characteristics of the person on the association between the independent and dependent variables" (1978, p. 14).

While occupational stress with its dominant pathogenic orientation, has identified many negative outcomes of job demands or role related stressors resulting in ill-health, poor mental health and other cognitive, behavioural and affective outcomes, we know little about that which keeps us healthy. Although some researchers have explored coping, positive or buffering moderators, it seems as though the third stage of the general adaptation syndrome (Selye, 1985) - exhaustion, informs the perspectives of the majority of researchers. Exceptions will be alluded to below.

However, the problem can be put this way: given the variability of individuals' responses to stressors, what is it that enables people to cope effectively and adapt appropriately to external or internal demands? What is it that allows for homeostasis to be restored when disrupted?

Therefore, in trying to implicate relatively stable and enduring characteristics of the person and the situation, this researcher turns to two sources: to the field of personality research and a conception introduced by Antonovsky, the Sense of Coherence (SOC), (1979, 1987) for the former, and to the concept of Job Decision Latitude introduced by Karasek (1979) for the latter.

#### **AIMS OF THE STUDY**

This research intends to examine the relationships between individuals' cognitive perceptions of stressors at work, and health, affective and behavioural outcomes. It also aims to explore the

moderating and main effects of SOC (Antonovsky, 1978, 1979) on these variables. Antonovsky (1987) contends that perceptions of stressors and outcomes may reflect the influence of an underlying disposition rather than operate as a moderator. This is similar to the issue posed by Brief and Atieh (1987) with reference to Negative Affectivity (Watson & Clark, 1984).

It will also explore the moderating and main affects of Job Decision Latitude (Karasek, 1979) and Participation in Decision Making variables. Thus, these variables aim to represent the relatively stable enduring characteristics of the person and the situation which House (1987) has referred to. The questions this research addresses are threefold:

- \* do blue collar workers experience work stressors typically operationalized in past research as stressful, thereby significantly associated with health, affective and behavioural outcomes?
- \* is a strong SOC associated with positive individual and organizational outcomes?
- \* are Job Decision Latitude and Participation in Decision Making associated with positive outcomes?

#### IMPORTANCE OF THE STUDY

The present study attempted to fill a gap in the South African *N.S.* literature. The findings could have important implications for concerned management and unions. A workplace that reduces the deleterious effects of poor design and poor management practices,

minimizes danger and disabilities, and increases participation in decision making is a necessary condition for wealth creation. Workers alienated from themselves, from others and from the processes of production cannot be expected to be willing participants in the process of production. Therefore, psychological research into the perception of the conditions of blue collar workers and their responses to these conditions increases understanding of the issues and factors in the workplace.

Secondly, this study attempts to explore the roles of a personality characteristic and features of the work environment in terms of the stressor-strain relationship, specifically at the level of blue collar workers, an approach which has been rarely pursued.

#### OVERVIEW OF THE STUDY

A questionnaire was designed which measured perceptions of various stressors and various outcomes, as well as and sense of coherence; job decision latitude and participation in decision making. Safety ratings were obtained from expert raters and data relating to age, hours worked, absenteeism, tardiness and sick leave were obtained from organizational records. Data were subjected to statistical analysis which examined the relationships between independent and dependent variables and the effect of the moderator variables on the relationship.

The study was limited by availability of organizational records, by self-report measures obtained from a questionnaire, by restriction of range because the sample consisted of skilled blue collar process operators, and by the correlational design.

The generalizability of the findings was limited by the restriction of the sample to blue collar workers from one organization, encompassing labour and capital intensive production processes.

Chapter 2 will present a model of stress and this will provide a framework for the review of literature in Chapter 3. Chapter 4 will present the methodology and Chapter 5, the results. This will be followed by a discussion of the findings, in Chapter 6.

## CHAPTER 2

### MODELS OF STRESS

The purpose of this chapter is to present a model of stress which will serve as a framework for the review of the literature. It will also clarify what is meant by the Sense of Coherence (SOC).

A number of models of stress exist in the literature and there are different foci for theoretical and practical work. A brief review of some definitions and conceptions will lead to the definition and model informing this research.

Shirom's (1982) facet analytical conceptualization views stress as arising from an employee's perception of an environmental demand which exceeds his or her resources. Shirom maintains that the employee's perception of the demand and his or her assessment of the resources' sufficiency to meet the demand occurs simultaneously and "the determination of the resources sufficiency is done in conjunction with the evaluation of consequences which might accrue if the demand is not met" (1982, p. 24). What does emerge from this formulation is the view of stress as being subjective and person-centred. It also emphasizes deficient capability to withstand a demand, an approach derived from the biological view of stress (Hinkle, 1973).

In contrast, McGrath (1976) defined stress as a set of preconditions. Firstly, the employee must perceive an

organizational demand addressed to him or her, which describes how the stress process begins. Secondly, this organizational demand must be perceived as out of balance with the employee's capability. This allows for a deficient and excess demand view of stress. Thirdly, failure to meet the demand should be perceived by the employee to result in differential rewards or conditions.

Underlying the above formulations is the Person-Environment Fit Theory. This approach predicts that a mismatch between the characteristics of a person and of the environment may be associated with psychological and/or physiological stress. French, Rodgers and Cobb (1974) proposed that there are two types of fit: subjective, and objective.

Objective fit refers to the match between the environment and the person's characteristics when both are objectively measured, independently of the person's perception.

Subjective fit refers to the congruence between perceived aspects of the environment and the person's cognitions of his/her characteristics. For subjective fit, a mismatch may occur when either the environment does not supply appropriate gratifications for the person's needs or wants, or the environment demands more than the individual is capable of supplying.

A problem of this model is its prediction of under- and overload. Although quantitative overload and qualitative underload

have been linked to physiological and biochemical responses (Frankenhauser & Gardell, 1976), the problem of where to set boundaries and limits remains. In a situation of underload, the person's capabilities and needs are not taxed by demands of the situation. For example, in the job design literature, Growth Need Strength, a characteristic of the individual (Hackman & Lawler, 1975) is used to explain or moderate the relationship between job characteristics and affective outcomes. If this relationship holds, then individuals with high Growth Need Strength in poorly designed jobs will experience the job demands as stressful.

Schuler (1982) too, has developed a model of stress. Stress is defined as a perceived dynamic state about something important. Stress, thus, can be positive and salutary, or negative; it is dynamic in that it results from reciprocal transactions between the person and the environment, is associated with physiological and socio-psychological conditions, is additive over time, and is precipitated by disruption of homeostasis. This integrative transactional process model of stress in organizations identifies stress and its symptoms as something which occurs over time, identifies critical individual characteristics during the time over which stress develops, and considers organizational conditions.

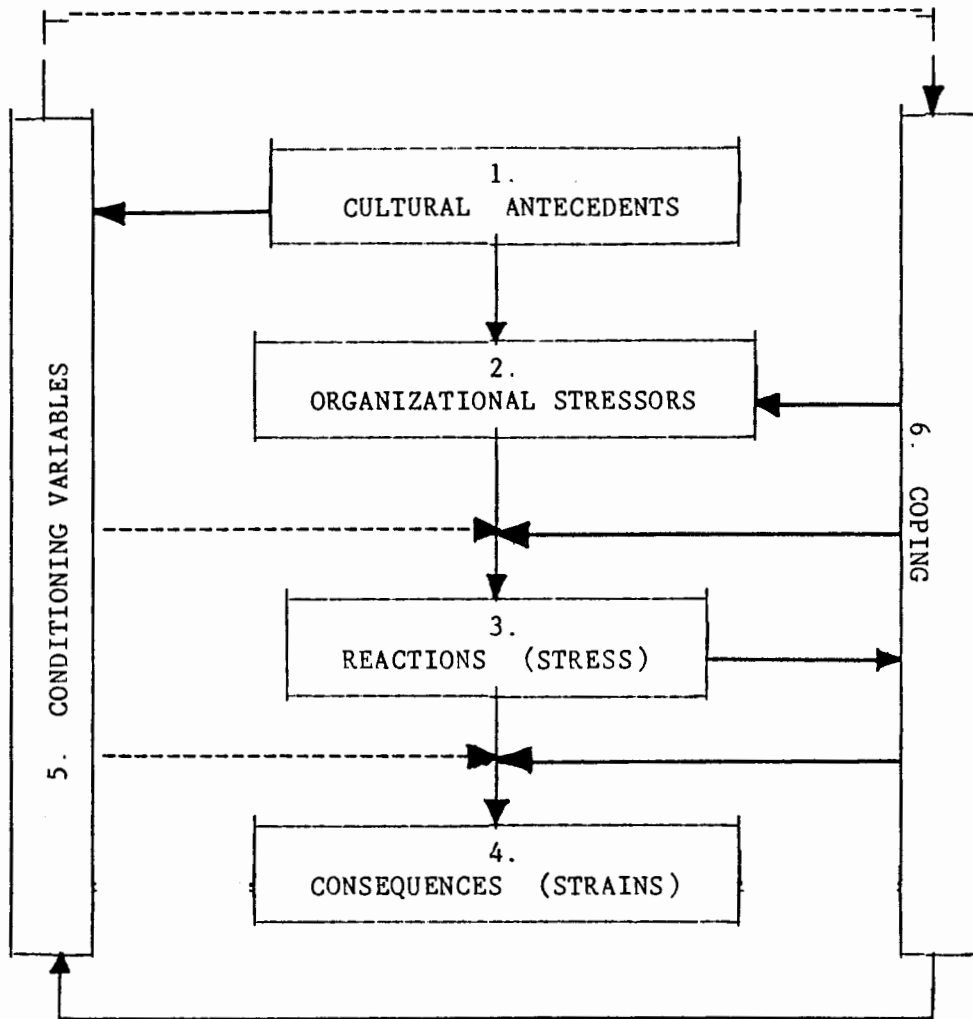
The limitless number of individual characteristics, wants and needs leads to conceptual confusion with many independent variables being used as dependent variables in a number of studies. Schuler (1982) noted that the task of dealing with stress is complicated by

the fact "that almost every aspect of the organization is labelled as stressful or stressor" (1982, p. 6). As a result, a limitless, multiplicity of stressors have been operationalized in the empirical work.

Notwithstanding these differences between the formulations and problems of operationalization, it is clear that stress is an ideographic and subjective phenomenon. It refers to a process which begins when demands are imposed on the person from the objective environment or internal perceptions. This disruption to homeostasis requires a response to restore homeostasis. In reaction to the stress and in order to manage the stress, the person will experience certain cognitive, behavioural and affective outcomes which go some way to restoring the balance. Particular mental, physical, behavioural and health outcomes may be associated with acute or chronic stressors. Personal, social and environmental conditions may or may not interact, and will influence the outcome of each of the stages.

From the foregoing, it is clear that stress derives from transactions between persons and their environments at conscious and unconscious levels. Its salutary or dis-stressful outcomes result from mismatches between the resources of a person and the demands of the environment.

Strümpfer (1983) presented a model of the interaction of organizational stress variables (See Figure 1). In the model,



**Figure 1.** Interaction of Organizational Stress Variables (Strümpfer, 1983, p. 376).

labelled rectangles denote classes of variables. Solid arrows indicate direct effects while broken arrows indicate conditioning effects whereby relationships may be strengthened or weakened. The model thus attempts to depict the complex and dynamic interactions between these variables.

**Cultural antecedents** capture the prevailing value systems, social, economic, political and ethnic factors which shape and limit individuals. **Organizational stressors** are classified in terms of levels of social interaction. At the **individual level** quantitative and qualitative overload and underload, obsolescence, job insecurity and unemployment could be stressors. At the **interpersonal level** factors such as role conflict, role ambiguity, lack of participation, lack of social support, responsibility for people and things exist. At the **group level** are stressors such as low morale and lack of cohesiveness. Relevant stressors at the **organizational level** are interdepartmental conflict, management styles, culture, policies, procedures and systems, and technology defined patterns of working and production systems. The level of boundary spanning does not seem relevant for the majority of blue collar workers with the possible exceptions of active and senior union members.

The classes of variables connoted by Reactions, Consequences and Coping will be dealt with in the review of the literature. Brief mention must, however, be made of the **Conditioning Variables**. They are considered to include constitutional and physical factors, psychological factors, behaviour patterns, stressful life events and

personality factors. There is a considerable body of evidence demonstrating interactions, simple and complex relationships between specific variables and organizational stress variables. The Sense of Coherence to be discussed below thus constitutes one of these conditioning variables.

### SENSE OF COHERENCE

Antonovsky (1979, 1987) expressed a concern with the pathogenic approach to the relations between stressors and health and well-being. He defined his task as one of trying to establish what makes people healthy notwithstanding "the ubiquity of pathogens - microbiological, chemical, physical, psychological, social and cultural" (1979, p. 13). Health is conceived of as a continuum ranging from ease to dis-ease and it is the SOC which determines where on the continuum an individual will stand. This continuum approach is similar to Selye's (1985) notion of stress as ranging from distress to eustress.

Antonovsky (1987, p. 19) defined the SOC "as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that:

- (1) the stimuli deriving from one's internal and external environments in the course of living are structured, predictable, and explicable;
- (2) the resources are available to meet the demands posed by these stimuli; and

- (3) these demands are challenges, worthy of investment and engagement".

The SOC has three components; Comprehensibility, Manageability and Meaningfulness.

1. **Comprehensibility**

Comprehensibility refers to "the extent to which one perceives the stimuli that confront one, deriving from the internal and external environments, as making cognitive sense, as information that is ordered, consistent, structured and clear" (Antonovsky, 1987, p. 16).

2. **Manageability**

This is defined as "the extent to which one perceives that resources are at one's disposal which are adequate to meet the demands posed by stimuli that bombard one" (Antonovsky, 1987, p. 17).

3. **Meaningfulness**

This provides the motivational element, and refers to "the extent to which one feels that life makes sense emotionally, that at least some of the problems and demands posed by living are worth investing energy in, are worthy of commitment and engagement, are challenges that are 'welcome' rather than burdens that one would much rather do without" (Antonovsky, 1987, p. 18).

Antonovsky believes that one can "specify a number of universal issues, confronted in every culture and by every human being, and posit the development in each person of profound tendencies to be located, throughout his or her life, somewhere on each of these continua. A dispositional orientation, then, is a relatively stable and constant orientation towards one of these universal issues" (1987, p. 183). He sees the SOC as one of these continua.

The SOC is regarded as a disposition, rather than a trait, since history, context, culture and socialization are argued to affect the development of and expression of the SOC.

Antonovsky (1987) pointed out that knowing a person's SOC will not enable us to predict a person's behaviour in response to a stressor but it will enable us to predict the quality of the behaviour. Thus, in terms of his stress model, the person with a strong and flexible SOC, will mobilize more generalized resistance resources (GRRs) than will a person with a lower SOC who will exhibit more generalized resistance deficits (GRDs). In a concrete situation the SOC will apply itself in a cognitive and emotional appraisal of the situation, seeking out GRRs, belief in self-efficacy and acceptance of challenge in the situation rather than the tendency to see chaos, feel hopelessness and burdened.

Antonovsky's model of stress centers on the issue of tension. A stressor is "a characteristic that introduces entropy into the system" (Antonovsky, 1987, p. 28), requiring adaptation from the

person. This tension must be transformed. If it persists, then the demand is construed as a stressor. Stressors may be salutary for individuals in that effective adaptive patterns coupled with high stressors may increase the person's repertoire of successful patterns of dealing with life's experiences.

The GRRs which contain one or all three of the elements of SOC "by definition creates life experiences characterized by consistency, participation in shaping outcomes, and an underload - overload balance" (1979, p. 28). Thus, persons with a strong SOC have a considerable range of GRRs available to them, in contrast to persons with low SOC's who have more GRDs. The theory assumes that all psychological stressors (chronic, major life events and acute daily hassles) are mediated by GRRs and the SOC. The SOC, thus, directly influences health and well-being in three ways:

1. It mobilizes GRRs and specific resistance resources (SRRs);
2. It enables a person to define certain stimuli or demands as innocuous or unwelcome;
3. It enables one to manage tension by singly or in combination, modifying the situation, controlling the meaning of the situation, and/or controlling the stressor.

Successful coping, thus, depends upon the SOC as a whole. It is conceivable that not all aspects or spheres of a person's life assume a subjective importance and it is therefore possible to have a strong SOC even though the scope of the SOC may be relatively

narrow. However, Antonovsky (1987, p. 23) contended that the boundaries of the SOC could never be so narrowed as to exclude four critical spheres of one's inner feelings, one's immediate interpersonal relations, one's major activities, and one's existential issues.

The relation between the SOC and health and well-being is of the nature that if the SOC is generative of good health, "and health has a positive influence on global estimates of one's well-being, then the two will be related, though indirectly" (1987, p. 181). It is also argued that many of the GRRs which promote a strong SOC are also directly related to well-being.

Both conceptually and empirically the SOC seems to bear some similarities to other and more recent views on health, stress and coping. Five formulations will be briefly alluded to.

Kobasa also evinced a salutogenic orientation and referred to the fact that the "personality emphasis has sought to determine the conscious psychological process by which persons efficiently recognize and act on their situations" (1982, p. 6). Her theory of the Hardy Personality has its roots in existentialism. Its three elements are commitment, control and challenge. Commitment is the ability to believe in the truth, importance and interest value of who one is and what one is doing. It also has an other-directed component which is based in sense of community. Both inner and other-directed aspects are hypothesized to ward off the illness

provoking effects of stress. Control refers to the tendency to believe and act as if one can influence the course of events. Challenge is based on the belief that change, rather than stability, is the normative mode of life. Kobasa (1979) found in a sample of executives that demographic variables did not distinguish between executives who reported becoming ill after experiencing stress, whereas measures of hardiness did. Kobasa, Maddi and Kahn (1982) found a main effect for hardiness.

Sutton and Kahn (1986) hypothesized that prediction, understanding and control are antidotes to organizational stress. Although their focus and definitions refer to aspects of the stress-strain interaction, their elements are similar to two aspects of the SOC. Prediction is the ability to forecast the frequency, timing, duration and quality of events in the environment. Understanding is knowledge about the causes of significant events in the workplace. Control is the exercise of effective influences over events, things and persons. The authors acknowledged that understanding, prediction and control will operate antidotally depending upon the nature of the stress and personality of the individual. Understanding and control in the situation seem to mirror the elements of comprehensibility and manageability as critical aspects of the person's disposition.

In an empirical test of the model, Tetrick and La Rocco (1987) in a sample of physicians, dentists and nurses found that understanding and control had moderating effects on the relationship

between perceived stress and satisfaction. Understanding, prediction and control had direct relationships with perceived stress while only control had a direct significant relationship with satisfaction. None of the three variables had significant direct relationships with psychological well-being.

Schuler (1982) also seemed to access the aspect of manageability when he proposed that individuals who engage in the process of gathering information, generating alternatives, selecting and implementing an alternative and evaluating the strategy, will be more effective and efficient at coping with stress than individuals who do not take such an approach to coping. Antonovsky (1987) has noted that a person with a strong SOC will define the instrumental parameters of the problem, thereby evoking the manageability component and making sense of the stressor.

Another related conceptualization is Ben-Sira's (1985) formulation of Potency defined as "a person's enduring confidence in his own capacities as well as confidence in and commitment to his/her social environment, which is perceived as being characterized by a basically meaningful and predictable order and by a reliable and just distribution of rewards" (p. 399). The concept is introduced in order to elucidate the mechanism whereby tension is resolved or potential resources are called upon. Ben-Sira regarded potency as a buffering variable which operates in the restoration of homeostasis once it has already been disrupted. It is regarded as latent and fulfils a delayed homeostasis-stabilizing function through its

capacity to prevent tension, following occasional inadequate coping, from turning into lasting stress. It therefore has a tension-bounding capacity. In these terms it bears a striking similarity to the SOC.

Finally, Watson and Clark (1984) have reviewed a construct, Negative Affectivity (NA), to explain the fact that a number of diverse personality scales such as trait anxiety, neuroticism, ego strength, general maladjustment, repression-sensitization, and social desirability, are measures of the same trait. Their data revealed a dimension of stable and enduring differences in mood and self-concept. "High-NA individuals are more likely to report stress, discomfort and dissatisfaction over time and regardless of the situation, even in the absence of overt or objective sources of stress" (1984, p. 483). High-NA subjects have less favourable views of themselves, of other people and are less satisfied with themselves and with life. High-NA subjects would thus seem to have more GRDs, fewer GRRs than Low-NA persons, and find their lives less comprehensible, manageable and meaningful.

Taken together, these formulations predict and illustrate the role of personality factors in the expression of behaviour, affect and cognition. In stressful circumstances individuals are presumed to act, think and feel in predictable ways as a result of their intensity of strength of SOC, Potency, Hardiness, etc.

## CHAPTER 3

### LITERATURE REVIEW

The purpose of this chapter is to review relevant aspects of the literature as they relate to:

- \* the field of occupational stress,
- \* blue collar stress,
- \* personality and stress.

The variables to be discussed are ordered according to Strümpfer's (1983) model. Only those classes of organizational stress variables which are relevant to the present investigation will be reviewed. Thus, cultural antecedents will not be reviewed and only brief mention of coping will be made.

#### Organizational Stressors

McGrath (1976) has identified six main sources of occupational stress. Task-based stress includes demands such as overload, difficulty and clarity. Role-based stress refers to ambiguity and conflict. Stress intrinsic to the behaviour settings includes the effects of crowding and undermanning. Stress arising from the physical environment includes cold, noise and fumes. Stress arising from the social environment comprises aspects such as interpersonal relations, privacy, isolation and participation. Finally, stress within the person system refers to variables such as anxiety, peripheral styles and other characteristics.

## Individual Level

### Quantitative Workload

Quantitative workload refers to having too much to do in one's job (French & Caplan, 1973). Overload can be considered to lead to a breakdown in system functions and is therefore construed as a stressor. Cooper and Marshall (1976) have described it as a job demand, a factor intrinsic to the job. It is also related to the concept of work pressure, a relevant feature in blue collar work which is machine-paced and human-paced.

Kahn, Wolfe, Quinn, Snoek and Rosenthal (1964) found that 45 percent of their survey sample reported that the quantity of their work interfered with how well they performed their work. In another study, Margolis, Kroes and Quinn (1974) found that overload was significantly related to a number of symptoms of stress: escapist drinking, absenteeism from work, low motivation to work, lowered self-esteem, and absence of suggestions to employers. While the reported relationships were significant, they explained very small amounts of the variance.

Frankenhauser and Gardell (1976) have studied the effects of under- and overload in Swedish sawmill operators. Their findings will be presented when relationships between stress and physiological outcomes are discussed below. In another study, House et al. (1979) found that high workload had significant relationships with self-reported neurosis, reports of itch and rash,

reports of cough and phlegm, and diagnosed hypertension, in their blue collar sample.

In a study of blue collar workers, Wells (1982) found that objective workload was not an accurate predictor of subjective perceptions of workload. Nevertheless, the objective measures of high workload were inversely related to control rewards (items which measured the degree to which the work pace was not exceptionally rapid and was subject to worker control), and intrinsic rewards (items which assessed the degree to which the work was interesting, challenging and varied, etc).

Cooper and Marshall (1976) have noted that while quantitative workload may be an obvious source of occupational stress, the available evidence does not suggest that on its own, it is a main factor in occupational ill-health. It is clear that the relationship of quantitative workload to outcomes are not simple, and may in fact be contingent and multi-dimensional.

Smith (1985) has suggested that levels of activity may be related to perceptions of workload and work pressure and it may be that short cycle repetitive tasks which require low levels of exertion are those which have deleterious effects on worker health. Karasek (1979) too, has suggested that job demands need to be considered in relation to the amount of control a person has over their jobs. This would seem to be relevant in the case of quantitative workload.

## Interpersonal Level

### Role Ambiguity

This brief review will focus only upon findings related to role ambiguity, notwithstanding the fact that role conflict and role ambiguity have been used extensively in organizational, occupational stress research. In their meta-analysis, Jackson and Schuler (1985) cited over 200 studies. Although many studies have operationalized both role ambiguity and role conflict, Van Sell, Brief and Schuler (1981) have noted that they are conceptually distinguishable types of role stress. Role ambiguity is considered as a situation wherein the single or multiple roles which confront the individual are not clearly articulated in terms of behaviour or performance levels expected (Kahn et al., 1964).

Kahn et al. (1964) defined role ambiguity as the degree to which clear information is lacking regarding:

- \* the expectations associated with a role;
- \* methods for fulfilling known role expectations; and/or
- \* the consequences of role performance.

Caplan and Jones (1975) found that lack of clarity about behavioural expectations causes a greater concern with own (versus work group) performance, lower actual and perceived group productivity, less concern or involvement with group, lower job satisfaction, unfavourable attitudes towards role senders, and increased tension, anxiety, depression and resentment. Brief and Aldag (1976) found a relationship between role ambiguity and

psychosomatic outcomes. i.e. anxiety, depression and somatic complaints, a sense of futility or lower self-esteem, lower levels of job involvement and organizational commitment, and perceptions of lower performance on the part of organization, of supervisors and of themselves.

Correlational studies have revealed differences in the impact of ambiguity across occupations. For example, Beehr, Walsh and Taber (1976) and Caplan and Jones (1975), have found role ambiguity to be associated with job dissatisfaction. However, studies amongst teachers (Tosi & Tosi, 1970), managers (Tosi, 1971), and supervisors and operating employees (Ivancevich & Donnelly, 1974) found no relationship. On the basis of Jackson and Schuler's (1985) meta-analysis, one can conclude that, notwithstanding the scarcity of experimental and longitudinal designs, there is evidence to support the assumption that role ambiguity is an antecedent of job dissatisfaction.

The relationship between role ambiguity and propensity to leave has also varied across investigations from positive (Ivancevich & Donnelly, 1974) to non-significant (Hammer & Tosi, 1974). The relationship between role ambiguity and performance has also varied from negative (Brief & Aldag, 1976) to non-significant (Tosi, 1971). Van Sell, Brief and Schuler (1981) suggested that results may be confounded by the fact that because incumbents "are ambiguous about the behavior required of them by supervisors, they may be working at the wrong things ... and are probably unaware that they are doing so" (p. 5).

Jackson and Schuler (1985) have noted that while participative decision making can reduce role ambiguity, it is possible that participative decision making interacts with role ambiguity to affect other outcomes, such as satisfaction and performance. Jackson and Schuler (1985) concluded that the correlations between affective reactions and role ambiguity are greater than average correlations between behavioural reactions and role ambiguity. They indicated a need for the identification of moderator variables to increase the proportion of explained variance accounted for by role ambiguity and role conflict. They also cautioned that "theoretical explanations for how and why a particular personality characteristic should act as an important moderator are unclear or completely missing in most cases" (1985, p. 27).

The conclusions to be drawn from this survey of the literature on role ambiguity is that an association is to be expected between measures of role ambiguity and health, affective and behavioural outcomes. Relationships with participation should also be evidenced and there is a need for moderator variables to be identified.

### Participation in Decision Making

Participation as a concept in organizational psychology has important implications. Sociological analyses debate whether participation increases workplace democracy or represents extension of management control (Fantasia, Clawson & Graham, 1988). Organizational psychology has focussed on participation at the individual level and sought to identify its correlates.

Participation in decision making is an important variable which is derived from the organizational climate or structure (Cooper & Marshall, 1976). There is a lack of clarity as to whether participation constitutes an independent variable (French & Caplan, 1973), or whether it is a causal determinant of role strains, e.g. role ambiguity and role conflict (Jackson, 1983), or whether it functions as a moderator, thereby constituting an important situational, work related first mediator (implied by Karasek, 1979).

An early study of participation in a sewing plant found that the greater degree of participation was related to improved productivity, higher job satisfaction, lower turnover, and better relations between workers and managers (Coch & French, cited by French & Caplan, 1973). French and Caplan (1973) reported that for a sample of university administrators, engineers and scientists, increased participation was associated with better relations with colleagues, immediate supervisors and subordinates, reduced role ambiguity, higher use of administrative and non-administrative skills and abilities, higher satisfaction, low job related feelings of threat, and higher feelings of self-esteem.

Margolis, Kroes and Quinn (1974) found that participation was significantly related to overall poor physical health, escapist drinking, depressed mood, low self-esteem, low life satisfaction, low job satisfaction, intent to leave, and absenteeism from work. Matthews, Cottingham, Talbott, Kuller and Segal (1987) found that participation was a significant predictor of diastolic blood pressure in an epidemiological study of blue collar workers.

Wall and Lischeron (1977) also found that among trained and untrained nurses, skilled industrial workers and three groups of local authority workers, those people who experienced more participation at all levels of decision making reported more satisfaction than "their less influential counterparts" (p. 76). However, in an experimental field study where participation was increased, there was no observable increases in satisfaction with pay, with the organization, opportunities for promotion, the job itself, immediate supervision, or co-workers. The only exception was improved relationships between workers and their immediate managers.

Jackson (1983) conducted an experimental field study wherein participation was manipulated, in a sample of nursing and clerical employees. Participation was found after six months to have significantly and negatively affected role ambiguity and role conflict and to have significantly and positively influenced perceived influence. Role conflict and role ambiguity were, in turn, significantly and positively related to emotional strain and negatively related to job satisfaction. Emotional strain was positively related to absence frequency and turnover intention. Jackson concluded that participation was an important determinant of role strains.

This brief review has highlighted some of the confirmatory findings of cross-sectional studies on participation and disconfirmatory findings of experimental studies. The problems with

the latter are twofold: can participation reveal its effects over a short time period, especially when the researchers have no control over the quality of the participative behaviours in the manipulation, and does participation function as an independent variable, or causal determinant of other variables (e.g. role strains), or as a mediator/moderator? Notwithstanding these questions, logically, participation can be thought of as increasing workers influence and control (Jackson, 1983) and formalizing communication on work tasks, processes and conditions (Fantasia, Clawson & Graham) and therefore can be considered to play a role in the stress-strain-outcome process. The correlational studies seem to confirm French and Caplan's (1973) profile of people who report higher levels of participation as experiencing lower psychological strain, higher utilization of skills, good working relations, positive attitudes to work, and higher productivity.

### Organizational Level

#### Machine-paced Work

An important aspect of many blue collar jobs is the fact that their work is paced by machines. Smith (1985) identified the loss of control due to the machine pace, repetitiveness and high work pressure as the three problematic aspects of machine-paced work. Salvendy (quoted in Smith, 1985), has identified four sub-classifications of machine-paced work. Three appear to describe the range of jobs performed by the blue collar workers in this study:

1. Paced work with buffer stocks is a situation in which machine operators have a supply of materials to work on and are not linked to other operators. If a cycle is missed, only that machine is affected.
2. Continuous paced operators are those in which the machine operates by machine activation. In such operations the worker is tied to other workers and a failure to perform his task will influence their ability to perform.
3. Discreet paced operators can be either a single operator or linked operators and can be self-activated by the operators or by the machine activation. There are discreet breaks in the activation cycle which allows for rest or stockpiling.

Human-paced work also seems to be relevant in the form of self-paced work which is paced by management objectives. In this type of pacing the worker can vary the rate of the work over the course of the work cycle. It should be noted that all of these different forms are influenced and to some degree constrained and defined by management objectives, demands, policies and procedures.

Some effects associated with machine-pacing are as follows:

- \* Frankenhauser and Gardell (1976) found that machine-paced workers had higher adrenaline levels than non-machine paced workers. Anxiety has been significantly associated with paced assembly workers, while repetitive paced assemblers reported greater job dissatisfaction and anxiety than non-repetitive unpaced workers (Broadbent & Gath, 1981);

- \* Apart from physical strain resulting from job demands, high levels of dissatisfaction, work pressure and psychomatic complaints have been found in paced operations (Hurrell & Smith, 1981);
  
- \* Varying emotional reactions in terms of anxiety, depression and anger have been associated with work pace (Stammerjohn & Wilkes, in Smith, 1985).

### Repetitive Work

Repetitive work operations have characterized production processes particularly in the manufacturing sector. Even the advent of new technologies create deskilling and allows "further job simplification and the creation of more, rather than less, routine and repetitive tasks" (Cox, 1985, p. 88).

Cox (1985) cited evidence which demonstrated that differences between industries and the nature of the work had different effects on people's perceptions of the works as pleasant/unpleasant and/or easy/difficult. Jobs that imposed high attentional demands and offered little opportunities for social interaction were judged as pleasant. Jobs which offered opportunities for social interaction resulted in workers perceiving tasks that demanded little attention as more pleasant than tasks which required high attentional demands.

Repetitive and monotonous work has been associated with feelings of boredom. However, O'Hanlon (1981) concluded that

evidence suggests that workers who complain of chronic boredom are more neurotic and less mentally healthy than those who do not. Workers who complain of boredom also experience feelings of anxiety or depression (Caplan, Cobb, French, Harrison & Pinneau, 1980).

Cox (1985) has reviewed a number of studies, to the effect that at the physiological level repetitive tasks make demands on postures, muscles and skeletons. Digestive system problems and behavioural problems have also been associated with repetitive work. Cox has concluded that in general, "it is relatively clear that workers engaged in repetitive work practices suffer poorer health than most other occupation groups" (1985, p. 108). Repetitive work needs to be considered in context of other factors since age, shiftwork, opportunities for social interaction, career stage and personality characteristics may interact to produce effects. Control/autonomy, simple or complex jobs may also influence outcomes.

### Shiftwork

Shiftwork is regarded in the literature as a major source of distress or strain on the individual blue collar worker. At the physiological level, the circadian system is required to adapt to externally imposed and changing time cues. Monk and Tepas (1985) have concluded that, regarding performance, decrements can be expected during night hours, given the relationship of the performance rhythm to the body temperature rhythm. Sleep, or the quality of sleep is regarded as symptomatic of shiftwork

maladjustment, as well as cause of it. Appetite and digestive disturbances, elimination problems, upper gastro-intestinal disorders, and poor general medical health have also been associated with shiftwork.

Shiftwork and its relationship to health can be considered to operate as both a main effect and an interactive effect, i.e. it may cause ill-health in the form of psychosomatic problems and it may decrease the resistance of the organism when other stresses are present (Monk & Folkard, 1983). Monk and Tepas (1985) have observed that, at the social level, three roles of the shiftworker as a spouse are affected, viz. those of sexual companion, social companion, and protector/care giver.

There exists also the potential disruption of social relationships and the possibility of social isolation. Zedeck, Jackson and Summers-Marca (1983) found that workers vary in their reactions to shiftwork and that these variations are systematically related to general job satisfaction, to satisfaction with the effects of the job on personal life and to perceptions of the work environment. Their data indicated that not all shiftworkers experienced health related problems. Thus, it seems that a process of adaptation to shiftwork occurs, with older workers adjusting to certain aspects of the shift, although they report ill-health. Whether ill-health is a result of shiftwork or a function of the ageing process is an issue. The data of Zedeck et al. (1983) support the latter explanation. They also found that poorly adapted workers

reported more ill-health and expressed a propensity to leave the organization. They support the idea that affective emotions change as the shift progresses and also allude to the difficulty of physical adjustment in respect of appetite and changing sleeping times.

### Danger

Danger, as a work stressor, has its roots in the experimental, environmental, and engineering psychology traditions, all of which have physical stressors as their focus and psychological strains and task performance as their outcomes. Remarkably though, extremely few studies have utilized danger as a variable in empirical research.

Perrow's work (cited by Jermier, Gaines & McIntosh, 1989) forms the conceptual background to the analysis of danger. Perrow believed that catastrophies are best understood in terms of the way in which elements in the organizational system interact. Thus, a high risk system is one which is complex where interaction sequences are unfamiliar and unexpected, and tightly coupled, wherein many elements directly affect each other. In high risk systems, therefore, we can expect there to be less variability in assessments of danger.

Jermier, Gaines and McIntosh (1989) have noted that danger has an element of occupational risk which is objectively verifiable but there are also individual and social constructions which will influence reactions to danger. In their study "the unit of exposure

to harmful agents or events is conceptualized as the product of potential severity of harm and the likelihood of the occurrence of harm" (1989, p. 16).

### **Consequences (Strain)**

#### **Stressors and Physiological Outcomes**

Frankenhauser and Gardell (1976) combined social psychological and psycho-physiological approaches to the study of overload and underload in Swedish sawmills. Their high risk group held jobs characterized by a combination of elements typical of under- and overloading situations and an extreme lack of personal control over the work process. They found the average adrenaline excretion to be higher in the high risk group than in the control group. Thus, the degree of repetitiveness had a direct relationship with adrenaline secretion, as well as an inverse relationship with self-reported measures of well-being. Noradrenaline secretion was highest in groups maintaining the same work posture throughout the day and decreased as freedom to move about increased. Noradrenaline excretion and irritation were higher when work was machine-paced than when the worker himself was allowed to control the pace. This study convincingly demonstrated a relationship between stressors and the strains, experienced both physiologically and socio-psychologically by the organism.

Matthews et al. (1987) explored the relationships between perceived work characteristics and diastolic blood pressure in a

blue collar sample. They found significant relationships between elevated diastolic blood pressure and having little opportunity for promotion, for participating in decisions at work, an uncertain job future, unsupportive co-workers and foreman, difficulties communicating with others, and overall dissatisfaction with the job. However, after breaking down the global indicator of job dissatisfaction, the only significant predictor was uncertain job future.

A number of inconsistent results have been found between work stressors and elevated diastolic blood pressure. Kasl (1978) has argued that a better research strategy is to concentrate on a few occupational settings which are highly similar in all but a few dimensions and have similar job occupants. More convincing pathogenic inferences could be made from specific work dimensions.

In a sample of blue collar workers, House et al. (1979) found that perceived stress is consistently positively related to self-reported angina, ulcers, neurotic symptoms, as well as to medical evidence of hypertension and other heart disease risk factors. They found that while strong associations prevailed between perceptions of stressors and self-reported health outcomes, the relationship between perceptions of stressors and medical evidence of health was "neither as strong nor pervasive" (1979, p. 148).

However, the strongest pattern of results were obtained from systolic hypertension. House et al. (1979) found that stress

interacted synergistically with exposure to chemical agents in producing symptoms of persistent cough and phlegm but not with respect to angina, ulcers or neurotic symptoms. They observed that synergistic interactions seemed to occur only for those symptoms likely to be produced by exposure to dust, fumes or chemicals.

Ischaemic heart disease (IHD) has been extensively studied in the epidemiological study of stress. While Mackay and Cooper (1987) noted that ischaemic heart disease has been excluded from the schedule of industrial diseases by the Industrial Injuries Advisory Council in the U.K. (1981), it is still regarded as a major distress outcome, being the major cause of death in industrial countries. The most widely accepted risk factors for IHD are smoking, elevated serum cholesterol levels and high blood pressure. However, the search has been extended to include sociological variables (socio-economic status), environmental factors (social support and occupational demands), and psychological factors [Type A behaviour, hardiness and learned resourcefulness (Rosenbaum, 1988)]. It was agreed that the presence or absence of these factors influences the physiological responses.

Kennedy, Kiecolt-Glaser and Glaser (1988) reviewed data wherein immunological changes were related to, on the one hand, acute and chronic stressors and on the other, affective outcomes such as loneliness, depression and attachment. The authors argued that quality interpersonal relations buffer the effect of stressors on immunological reactions which are, in turn, related to psychological distress.

Krantz and Raisin (1988) argued that physiological reactivity to emotional stress, may be a marker of processes involved in the development of coronary heart disease and/or essential hypertension. Reactivity is determined by measuring the cardiovascular and/or endocrine changes that occur in response to stress. However, Krantz and Raisin (1988) also noted a perceptual phenomenological component, in that the relationship of occupational factors (representing a class of occupational stressors) to IHD depends upon the meaning of the situation to individuals and upon the way they perceive their life situations.

The conclusion to be drawn from this review of organizational level stressors and their associations with strain outcomes is that, while particular processes and patterns of organization of work have direct physiological consequences for workers, the behavioural, cognitive and affective consequences are ambiguous. Physiologically there may indeed be a nomothetic relationship but at other levels the relationship is ideographic, supporting the notion that the response to specific stressors vary (Selye, 1985).

#### **Conditioning Variables**

According to Strümpfer's (1983) model, conditioning variables impact in two ways. Firstly, they condition the relationship between stressors and strains, mainly by affecting the person's appraisal of the stressor as threatening or not, i.e. controlling the meaning of the problem. Secondly, they condition the relationship between stress and strain, somehow enabling the person to accommodate the

stress without being overwhelmed by it, so that it does not develop consequences. The conditioning variables, thus, act as moderator variables. Folkman and Lazarus (1988) defined a moderator as an antecedent condition such as gender, socio-economic status, or personality traits that interact with conditions in producing an outcome. Three conditioning variables whose moderating effects have been explored will be discussed below: social support, personality characteristics and job decision latitude. The Type A Behaviour Pattern is excluded since the variable has rarely been operationalized in studies of occupational stress amongst blue collar samples.

### Social Support

A construct used extensively as a moderator variable in research has been social support. Although it represents an important situational variable, hypothesized to either buffer or to have main effects on the relationships between stressors and outcomes (House, 1983), the evidence has been mixed, with many inconsistent findings. A brief consideration of the effects of social support is in order because it suggests gaps in occupational stress research that will lead to consideration of personality factors as an important intervening variable.

Williams and House (1985), while noting the absence of a clear definition of social support, defined it as a "flow between people of emotional concern and caring, information, and instrumental help" (p. 207). Social support is hypothesized to have two main effects:

- \* directly enhance health and well-being by supplying human needs; and
- \* directly reduce levels of stress in the workplace by reducing interpersonal tensions.

Its third effect is a buffering or interactive one, similar to the "innoculation effect", whereby it modifies the relationship between stress and health and protects the individual from the negative consequences of stress.

Antonovsky (1979) considered social support to be a sociocultural variable which links health and the SOC. It can "enhance the ability of the individual to obtain meaningful information, or ... enhance the sense of coherence" (pp. 167-168). Social support could, in fact, be one of the GRRs or specific resistance resources that a person can draw upon to manage the tensions imposed by stressors. Some of the relevant research follows.

Wells (1982) found that social support and objective conditions interact in determining perceptions. He interpreted this as a buffering effect wherein social support provides a context which significantly alters perceptions of job conditions. Supervisor support was regarded as important with regard to buffering.

The Tecumseh and Alameda County Studies (quoted in House, 1983) found gender differences in benefiting from and giving social support. Dooley, Rook and Catalano (1987) have explored support in

job and non-job spheres and concluded that there is little evidence to support the moderating effects of social support. Kaufman and Beehr (1986) found that in a sample of nurses, social support operated in a counter-intuitive fashion, strengthening the positive relationship between stressors and strains.

Caplan et al. (1980) found that social support from people at work was associated with lower levels of stress at work, while social support from home was unrelated to work stress. Support at home and work, however, was found to buffer the effects of the impact of work stress on a number of health outcomes. In a factory sample which had limited opportunities for interaction, House (1980) found that supervisors' support was most effective in buffering the effect of stress. In contrast, House and Wells (1978) have found co-worker support to be most consequential.

These findings contain a number of inconsistencies and there is a need to specify "the conditions under which given types of relationships and supports do or do not affect given indicators of stress and health" (House, 1983, p. 8). The studies on social support suggest the need to differentiate between types of and sources of support (job, non-job, supervisor, peer), and specification of strain and stressor in order to make sense of the data.

These findings also allude to the complexity of the operation of moderators in occupational stress. For example, Zautra (1983)

has argued that social support would be most likely to serve as a buffer if it is specific to the needs posed by the stressor. The findings direct attention to the need for more specific theories which specify, for example, types and timing of social support (Jacobson, 1986), sources of social support, and probably most important, the job/or occupational context, and the reasons for the mechanisms of the effects of social support.

### Personality Characteristics

The studies and findings cited below all appear to fit into the class of conditioning variables which affect the relationship between stressor and strain, enabling the person to accommodate the stress without being overwhelmed by it. Absent, however, are studies that test how the personality variables affect the appraisal of the stressors, or the link between personality variables and the coping responses of workers in response to specific organizational stressors.

Kahn et al. (1964) concluded that "neurotic" and "non-neurotic" reactions to role conflict are substantially similar and that sufficient environmental stress may produce neurotic symptoms even in those who show little predisposition to neurotic anxiety" (p. 263). They also found that introverted persons who were perceived by others as unsociable and highly independent, faced strong role conflicts and experienced high levels of tension. In a similar vein, they found that people characterized as flexible rather than rigid were more likely to experience stronger role conflict in the form of being unable to reject a role sender's demand.

Growth Need Strength has been extensively studied as a moderator of the relationship between job characteristics and individual outcomes in the work design literature. Beehr, Walsh and Taber (1976) found that role stressors (non-participation, role ambiguity and role overload) and their relationship to individual outcomes (work motivation), were moderated by Growth Need Strength, i.e. the relationship between role stressors and individual outcomes were stronger for people with stronger Growth Need Strengths.

Garrity, Somes and Marx (1977) investigated personality factors in resistance to illness after recent life changes. They found that social conformity reduces the risk of adverse health changes after the onset of life changes, while liberal intellectualism and emotional sensitivity appeared to raise susceptibility to illness. Although their findings on intellectualism seem to counter the view on effective coping, the value of their research resides in the fact that personality factors significantly improve the predictability of deleterious health changes.

The work of Eysenck (1983) and his colleagues, has revealed many links between high neuroticism scores and low incidences of cardiovascular disease and cancer. Eysenck (1983) maintained that the "innoculation effect" or desensitization effect has been clearly demonstrated in cancer research, but has been less evident in the case of coronary heart disease.

In a longitudinal study, Delongis, Folkman and Lazarus (1988) examined daily stress processes in married couples. They found that participants with low unsupportive social relationships and low self-esteem were more likely to experience psychological and social problems both on and following stressful days than were participants high in self-esteem and social support. The data were interpreted to mean that persons low in psycho-social resources are vulnerable to illness and mood disturbance when stress levels increase, even if they have little stress in their lives. This study suggests the possible interactive and main effects of personality variables in the study of occupational stress.

Frew and Bruning (1987) investigated the predictive power of organizational variables (sources of role stress and job characteristics), and personality characteristics (manifest needs, Type A personality and self-esteem) on physiological and attitudinal measures of stress. The personality characteristics accounted for 37 percent of the variance in manifest anxiety. However, the best predictor was Type A personality. The personality variables as a set were not significantly related to the physiological measures, viz. diastolic and systolic blood pressure and galvanic skin response.

Arsenault and Dolan (1983) operationalized two measures of personality in their study of the role of personality, occupation and organization, in understanding the relationship between job stress, performance and absenteeism. They used Rotter's Locus of

Control and the "Striver-Achiever" scale, the latter measure being similar to the Type A personality. Personality was found to have a significant effect on qualitative performance but not on absenteeism. Their combined personality index yielded four types, two of which exhibited behaviour withdrawal when exposed to job context stress. They hypothesized that the behaviour is consistent with active and passive avoidance (high competitiveness and high internal locus of control, and low competitiveness and high external locus of control). Their blue collar sample was characterized by the latter.

The studies cited above allude to the role of personality characteristics in the stress-strain relationship. However, there is no consensus on choice of personality measure, or where primarily, in the stress process personality plays a role. There is also a lack of clarity regarding the main, buffering or possible mediating effects of personality.

#### Job Decision Latitude

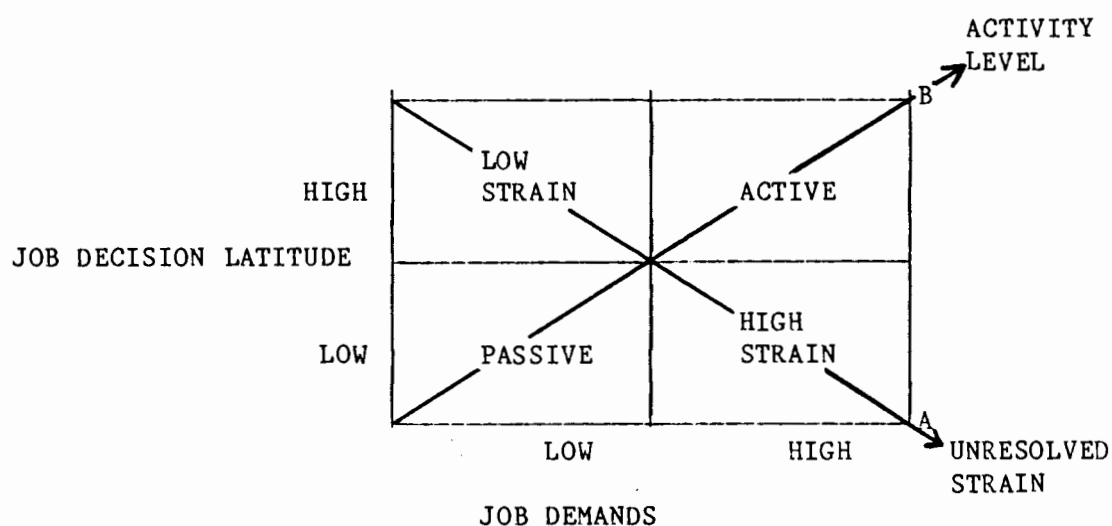
Karasek (1979) provided a job strain model which explains ambiguous and apparently contradictory findings in stress research. An example would be Ritti's (1971) finding that time pressure demands are associated with strain symptoms, while intellectual demands are not. Karasek (1979) explained that unless a distinction is made between job demands placed on the worker and the discretion permitted the worker in deciding how to meet these demands, and consideration of their different effects, one would be likely to assume that job strain increased with all such "demands".

A second problem addressed by the model is the lack of significant empirical association between job conditions and mental strain or dissatisfaction. Karasek hypothesized that by adding demands and discretion together, relationships with strain symptoms would cancel each other out since the "opportunity to use skill and make decisions reduces the undesirable effects of job demands" (1979, p. 286).

A third aspect is that individual characteristics are introduced as mediators of the relationship between job demands and outcomes too soon, without sufficient attention to environmental characteristics, and this has implications for changes to the work environment or policy. The job strain model has two axes representing job demands and job decision latitude (see Figure 2). Job demands range from low to high and refer to aspects of the work situation operationalized as stressors. Job decision latitude also ranges from low to high. Karasek believed that demands, especially workload demands, relate to the overall output level of the firm while job decision latitude is closely related to the firm's authority structure and technology. Job strain results when demands are high and decision making latitude is low. This composite measure, job strain, is related to symptoms of mental strain.

Two predictions are made. Following diagonal A in Figure 2, as job demands increase relative to decreasing job decision latitude, strain increases. In their study of sawmill operators, Frankenhauser and Gardell (1976) supported this notion. Secondly, incremental

addition to competency are predicted to occur when the challenges of the situation are matched by the individual's skill or control in dealing with the challenge, i.e. following diagonal B in Figure 2.



**Figure 2** : Job Demands - Control Model (Karasek, 1979, p. 288)

On the basis of "authority is commensurate with responsibility" Karasek expected the two aspects of the job to be highly correlated. He confirmed empirically, however, that on U.S. Quality of Employment Survey Data, 1972 (1979, p. 288), the correlation is low. This was interpreted to mean that there were large groups of workers with discrepant demands and job decision latitude, thus supporting the independence of these two aspects of the job.

Using the model, Karasek (1979) found that workers in high strain jobs reported exhaustion after work, trouble awakening in the morning, depression, nervousness, anxiety and insomnia or disturbed sleep. High strain jobs were strongly associated with pill

consumption and number of days of sickness. In addition, both low strain jobs and passive jobs exhibited secondary peaks in job dissatisfaction. Karasek interpreted the former finding to mean that jobs which are too comfortable may not provide sufficient strain for the organism. The latter finding was interpreted to mean that "'active' or 'passive' job content could quite plausibly be a component of job-related feelings of satisfaction" (1979, p. 297).

Landsbergis (1988) tested Karasek's model in a sample of hospital and nursing home employees. The results supported the hypothesis that reported job strain (job dissatisfaction, depression, psychosomatic symptoms), and burnout are significantly higher in jobs that combine high workload demands with low decision latitudes.

Another empirical test of the job demands - control model was taken by Spector (1987) amongst a sample of clerical workers. The regression analysis failed to confirm the interaction hypothesis although measures relating to control and job stressors were found to be correlated with satisfaction and health outcomes. This finding is in line with Payne and Fletcher's (1983) study on school teachers which also confirmed the association of discretion and job demands associations with outcomes although none of their interaction terms were significant. Again, individual effects of perceived control and demands were associated with outcome measures in a laboratory study (Perrewe & Ganster, cited by McLaney & Hurrell, 1988), but only one out of twelve interaction terms achieved statistical significance.

It appears then that the evidence for the interaction of job demands and control is mixed when specific occupational samples of modest size are used in comparison to national employment survey data. However, it is reasonable to expect that perceptions of job demands and of decision latitude, i.e. control, will be significantly associated with health and satisfaction outcomes. It is also possible that job decision latitude moderates the relationship between stressors and outcomes.

### **Coping**

While this investigation will not deal with the subject of coping, a brief discussion of the process is required, since it forms a crucial part of the stressor-strain-outcome process. It is necessary to briefly relate the SOC to recent formulations and findings in relation to coping within the field of stress research.

Cox has noted that stress "resides in the person's perception of the balance between the demands on them and their ability to cope with those demands" (1987, p. 6). Thus, coping can be defined as the process of managing external and/or internal demands that tax or exceed the resources of the person (Lazarus, quoted in Folkman, 1982).

The cognitive-phenomenological approach to stress developed by Lazarus (1966) has focussed upon the appraisal process which occurs during a person-environment encounter. In the case of primary appraisal, the person establishes what is at stake. The person,

thus, establishes the meaning of the encounter. Antonovsky recognized the importance of this when he wrote, "the extent to which one approaches the world with the generalized expectation that stressors are meaningful and comprehensible lays the motivational and cognitive basis for managing and preventing the transformation of tension into stress" (1987, p. 137).

The secondary appraisal requires the person to establish what can be done. Antonovsky (1987) considered the secondary appraisal stage to be one wherein the demand or stressor must be defined as benign, irrelevant or harmful. Coping is, thus, initiated in response to a stressful appraisal. Stressful appraisals according to Folkman (1982) signal harm or loss (where damage has already occurred), threat (where harm or loss is anticipated), and challenge (where an opportunity for mastery or gain is anticipated).

Coping is considered to have two major functions (Folkman, 1982; Folkman & Lazarus, 1988): problem-focussed and emotion-focussed. Problem-focussed coping is aimed at managing or altering the problem which results in an altered person-environment relationship. Emotion-focussed coping is aimed at managing or redefining emotional distress which may result in a change in attention or meaning. It should be noted that both forms may require behavioural and cognitive strategies. In a study of coping in a sample of 100 adults, Folkman (1982) found that in less than 2 percent (18) of 1 332 reported episodes, only one of the two major functions was used. It was also found that work-related episodes

had higher amounts of problem-focussed coping than family or health-related episodes.

Folkman and Lazarus (1988) have presented a model of coping as a mediator of emotion. In their transactional model, coping is considered to arise during the appraisal of the person-environment encounter and is considered to transform the original appraisal and the quality and intensity of its attendant emotions. They examined the extent to which eight different forms of coping predicted four types of emotion in stressful events of day to day living. They found that planful problem-solving was associated with less negative emotion and more positive emotion, and that confrontive coping was associated with worsened emotional states in the younger group, while distancing contributed to worsened emotional states in both younger and older people. Folkman and Lazarus (1988) cautioned that the results should not be interpreted to mean that planful problem solving is an inherently adaptive form of coping, since the context will determine the adaptiveness of the coping strategy.

There are, however, very few studies which have explored the appraisal and coping processes in relation to specific work stressors. As appropriate as the theories and models may be, there is little empirical evidence of the coping processes and strategies utilized in the organizational context. Jackson's (1983) study of participation in decision making as a strategy for reducing job-related strain, referred to above, is an exception. However, the study did not assess the quality of participation, and nor did

it intentionally set out to explore the role of participation in decision making as a coping strategy.

#### GAPS IN THE LITERATURE

Eysenck (1983) proposed that personality is inextricably linked to stress for two reasons:

1. Numerous studies have found that what is stressful for one individual is not experienced as such by others. Consequently, "stress can only be defined in terms of strain experienced by the individual, and identical situations may or may not give rise to strain in specific individuals" (p. 121-122).
2. Secondly, "we cannot make verifiable predictions from general laws without incorporating specifically a variable K which refers to the constitution of the individual for whom the prediction is being made" (p. 124).

Although the individual is at the centre of the stress experience, there has in fact been little exploration of the affective meaning of the experience for the individual (House, 1987), or those psychological characteristics of the person that substantially influence the individual's perception of stressors, reaction or action and outcomes. Most models of stress, whether viewing stress as a stimulus, response, perception or transaction, acknowledge the importance of individual characteristics and traits or dispositions in their theoretical formulations, but fail to

specify precisely which one or more complex ones should be measured. Most models go on, instead, to identify cause effect relationships between for example, job demands or role characteristics and psychological and health outcomes. They consider source, type and duration of the process or variable under question and relate these in terms of within and between subjects effects.

Notwithstanding the success of demographic variables such as age, level in the organization, tenure and socio-economic status in predicting variations in outcome variables, very little is known about the personalities of these subjects, with the exception of the few formulations and studies reviewed above. Thus, in terms of the field of occupational stress as studied by industrial and organizational psychologists, a large gap exists with respect to the formulation of personality traits/characteristics or dispositions which affect the stress process or experience. It seems as if there is a need to bridge the gap between clinical developments in stress research and industrial/organizational formulations. It should, however, be noted that the identification of traits or dispositions is a first step - the need to explore how they actually operate remains.

Apart from the methodological criticisms - too few prospective studies, correlational designs, overreliance on self-report measures, and inadequate exploration of moderator effects - the fact that at the conceptual level, this author can only single out one

major gap in the research, i.e. the inadequate specification and operationalization of personality measures, is testimony to the amount of studies undertaken in the field of occupational stress.

The other major gap is the paucity of research into eustress. The pre-occupation with negative and adverse outcomes associated with the job demands milieu (Payne, Jabri & Pearson, 1988) is in imbalance relative to those persons who experience work as positive and have positive affect and cognition in relation to work. As mentioned above, the pathogenic orientation has predominated occupational stress research and there is relatively little empirical work and theory that considers salutogenesis.

## CHAPTER 4

### METHODOLOGY

The purpose of this chapter is to present the hypotheses to be tested, and the research design and methodology employed in the present study. The variables used and their measurement will also be described.

#### HYPOTHESES TO BE TESTED

The review of literature in the previous chapter focussed upon a number of organizational stressors and conditioning variables, and reviewed some of the relationships between these variables and a number of health, behavioural and affective outcomes. Also evident from the review, was the increasing complexity of occupational stress theory and research.

Four hypotheses will be tested in this study. The first relates to the relationship between organizational stressors and outcome variables. It should, however, be noted that Fletcher and Payne (1980) found that only 10 percent of the working population report strain at any one time. This means that random selection could include 90 percent of the population who do not report strain or suffer distress at any one time. Therefore, this fact could impact upon the relationship between stressors and strain outcomes. Secondly, Motowidlo, Packard and Manning (1986) observed that there are specific events which are more likely than others to cause stress, and that these specific events may vary from one job to another. Therefore, the relationship between stressors

and outcomes may be influenced by the fact that stress is not a specific response but, is in fact, a specific response which is determined by the psychological meaning ascribed to the stressor by the subject. Notwithstanding these two observations, the first hypothesis states:

- \* The organizational stressors will be significantly associated with affective, behavioural and health related outcomes.

In the review of literature, and in the presentation of Antonovsky's (1979, 1987) formulation of SOC, evidence was provided which suggested that personality predispositions may influence the perceptions of stressors, in accordance with observations by Kobasa (1982) and Brief and Atieh (1987). Therefore, the second hypothesis addressed the relationship between a personality predisposition, in the form of the SOC, and organizational stressors. The second hypothesis, thus, states:

- \* The Sense of Coherence will be significantly associated with perceptions of stressors.

The third and fourth hypotheses explore the relationships between the conditioning variables, and outcome variables, and organizational stressors and outcome variables. The SOC is argued to have salutary effects on health and well-being (Antonovsky, 1987), while Job Decision Latitude (Karasek, 1975) is regarded as an important moderator of the relationships between organizational

stressors and outcomes. Participation in Decision Making has also been presented as having two elements; an individual coping strategy component and a situational job related component. Thus, of interest are the roles played by the personality predisposition, the SOC, a situational variable, represented by Job Decision Latitude, and Participation in Decision Making, conceptualized as having both individual and situational components, in affecting a variety of outcomes and, in changing the relationship between organizational stressors and outcome variables. Thus, the third hypothesis states:

- \* The Sense of Coherence, Job Decision Latitude and Participation in Decision Making will be significantly associated with affective, behavioural and health outcomes.

and the fourth hypothesis states:

- \* The Sense of Coherence, Job Decision Latitude and Participation in Decision Making will moderate the relationship between stressors and outcomes.

#### **SAMPLE**

The sample that was drawn at first consisted of White and Black male blue collar skilled process operators at one large manufacturing site employing 7 000 people. Although there were three job grades, interviews with incumbents and managers revealed that the jobs do not differ qualitatively and quantitatively from

each other. The sample worked in labour intensive and capital intensive production plants. At the time of the data collection, the total population of skilled operators numbered 307. 307 questionnaires were distributed and 151 useable questionnaires were returned, representing a response rate of 49,2 percent. Only 40 of the respondents were Black and as a result of the complex issues relating to race and culture, the data of that sub-sample was excluded from further analysis. Thus, the response rate for the White sample was 46.6 percent. The age range was 21 years to 60 years with a mean age of 36 years (SD = 10.3). The mean length of service was 7 years and 2 months and ranged from 1 year to 38 years and 6 months.

#### QUANTITATIVE DATA COLLECTION

A questionnaire was designed for the study and permission to distribute the questionnaires was obtained from management and the unions. A covering letter explaining the purpose of the study and guaranteeing confidentiality accompanied each questionnaire (Appendix A). Each questionnaire was numbered in order to enable the researcher to gather data from organizational records. Questionnaires were distributed through the internal mail system to each respondent individually, together with a confidential addressed return envelope.

## **Measuring Instruments**

### **Independent Variables**

From the literature the following variables were included as stressors: Quantitative Workload, Role Ambiguity, Danger, Hours Worked and Overtime. These variables, thus, sample four of McGrath's (1976) sources of stress: quantitative workload samples task-based stress, role ambiguity samples role-based stress, danger samples stress arising from the physical environment, and hours worked and overtime sample stress intrinsic to the behaviour setting.

#### **Quantitative Workload**

This self-descriptive variable was assessed by means of four items taken from Caplan et al. (1980, p. 250). Considered together, the items access the aspects of pace, time, intensity and volume. These specific aspects together constitute a task-based job demand of workload/overload. Scores could range from 1 to 4 with a minimum value of 4 and a maximum value of 20. (See Appendix A, Items 1-4).

#### **Hours Worked / Overtime**

Hours worked and overtime hours were manually determined from organization records for a sample period of two months. The author would argue that these stressors are intrinsic to the behaviour setting.

### Role Ambiguity

This variable was assessed by means of four items also taken from Caplan et al. (1980, p. 245) The items together constitute the role-based stress of ambiguity. The items refer to clarity regarding job responsibilities, others' expectations, prediction of others' expectation, and work objectives. A 5-point rating scale was employed, with a lowest attainable score of 4 indicating low role ambiguity and a maximal score of 20 indicating high role ambiguity. (See Appendix A, Items 12-15).

### Danger

Two items concerning dangerous work were written for the study and the sum of the degree of danger and frequency of thinking about the danger constituted the score (see Appendix A, Items 9-10). Danger thus represents a stressor arising from the physical environment.

In an attempt to validate the danger self-ratings, a group of expert raters, comprised of experienced line managers and job evaluation experts were asked to rate a sample of 25 jobs. The unit of exposure was conceptualized as the product of the degree of exposure and the degree of potential harm or threat. The degree of exposure ranged from 1 to 4: from (1) no exposure, to (2) exposure to noise, fumes, dust and gases, to (3) exposure to noise, fumes, dust, gases and explosives, and (4) exposure to noise, fumes, dust,

gases, explosives and moving machinery and pressure pipes. The degree of potential harm or threat ranged from 1 to 3: from (1) no threat, to (2) threat of disabling injury, and (3) to life threatening. Scores thus ranged from 1 to 12. The raters agreed on 21 of the 25 jobs with only one point differences on the remaining four jobs. These expert ratings correlated significantly with danger self-assessment ratings ( $r = 0.29$  ,  $p < 0.001$ ). The relatively low correlation between the personal and expert assessments probably reflected the appraisal aspect of stressors: a person directly exposed to a threat probably appraises it differently from an outside rater who might use scientific or technological data, rather than emotional reactions, as grounds for appraisal.

### Moderator Variables

Three variables were selected as moderator variables. The statistical treatment explored the main effects of these variables treating them as independent variables but, in addition, tested their moderator effects. The variables were Sense of Coherence, Job Decision Latitude and Participation in Decision Making.

#### Sense of Coherence

The SOC was measured by using Antonovsky's short form 13-item scale (1987, pp. 190-194). It contains five comprehensibility items, five manageability items and three meaningfulness items. A 5-point scale was used in the present study, rather than a 7-point

scale as in the original, in order to simplify the rating procedure (see Appendix A, Items 57-69). The alpha co-efficient for the long form has ranged from 0.837-0.983. In a 1985 study of New York production workers the Cronbach Alpha was 0.933. No data area available for the short form. For this study the alpha co-efficient was 0.84.

### Participation in Decision Making

Participation was assessed by means of three items from Caplan et al. (1980, p. 250). The items measured the extent to which a worker participates with others to make decisions, set procedures and allocate work (see Appendix A, Items 17-19). These items scored in reverse to indicate a lack of participation, constitute a stressor arising from the social environment (Jackson, 1983; Jackson & Schuler, 1985). Participation in decision making is operationalized as a moderator in the present study since it is viewed as a personal coping strategy with some organizational support.

### Job Decision Latitude

There is little consensus at present on a job decision latitude scale. Job decision latitude has been conceived of as having two elements, demands and control. These have been measured separately in three studies (Harenstam, Theorell, Orth-Gomer, Palm & Unden, 1987; Karasek, 1979; McLaney & Hurrell, 1988; Spector, 1987). The

element of control has varied across the studies with McLaney and Hurrell (1988) deriving four types of control.

On the basis of personal communication with D J W Strümpfer, seven items were written for the present study. The items were included on the basis of definitions of items in Hackman and Lawler (1971), Hackman and Oldham (1975) and Karasek (1979). Control over decision making (three items), autonomy and responsibility, variety, skill and training, and originality were combined to produce a composite score. (See Appendix A, Items 20-26). A 4-point scale was used implying that a score of 7 reflected low decision latitude and a score of 28 reflected high decision latitude.

The alpha co-efficient was 0.61, a low figure, but expected in short scales which are frequently unreliable. The composite score reflects control and job characteristics, whereas other measures have separated these elements.

### Outcome Variables

An issue regarding outcomes is whether to classify them into individual/organizational categories or as affective, behavioural and health categories. In keeping with authors, who in recognizing the increasing complexity of relationships in behavioural science research and who suggest the need for more aggregation of variables (Arsenault & Dolan, 1982; House, 1987), this author prefers the latter classification.

A second reason for doing so relates to the changing relationship between individuals and organizations in South Africa. Employers are taking responsibility for more than a contract of employment, since access to and consumption of social services is considered to be dependent upon one's employment status. Hence, using an individual framework forces organizations to consider stress in relation to an individual, and to recognize that all stress related outcomes have implications for an organization.

### Affective Outcomes

#### Job Involvement

Job involvement was assessed by means of four items from Lodahl and Kejner's (1965) 6-item scale which has shown a reliability estimate of 0,73 and was considered by Morrow (1983) to be satisfactory. Two items, however, were omitted on the basis of their low loadings on the job involvement factor in Lawler and Hall's (1970) study of the relationship of job characteristics to job involvement, job satisfaction and intrinsic motivation. The second item had modified wording from "work" to "job" (see Appendix A, Items 5-8). Job involvement measures what Lodahl and Kejner defined as "the degree to which a person is identified psychologically with his work, or the importance of work in his total self-image" (1965, p. 24). Lawler and Hall (1970) agreed that it is a function of the person but acknowledged that it could result from the individual-job characteristic interaction.

### Job Satisfaction

Job satisfaction was measured by means of two items from Beehr, Walsh and Taber (1976). As used here, the second item omitted "whether" and utilized a 4-point scale, instead of a 3-point one as in the original item (Quinn & Shephard, 1974). (See Appendix A, Items 29-30). The sum of the ratings constituted the score, with a score of 2 representing low job satisfaction and a score of 8 representing high job satisfaction.

### Life Satisfaction

It was felt important to obtain a measure of general satisfaction with life. Rice, Near and Hunt (1980) found that less than 10% of the variation in life satisfaction can be attributed to job satisfaction. Brief and Atieh (1987) in commenting on this finding, noted that job satisfaction as an index of job related strain, is not substantially related to well-being of life as a whole. This suggests that job-related measures have a pragmatic relationship to well-being in life. Given these findings and comments, it is necessary to measure well-being in life.

General satisfaction with life was measured by a single rating, adapted from Cantril's (1965) Self-anchoring Striving Scale. This measure consists of a ladder with its steps numbered and the highest and lowest steps labelled. Cantril used a 9-step scale but in the present form, 10 steps were used (to bring it in line with General

Health Rating to be described below). The top rung was described as "The best life you might expect to have", and the bottom rung as, "The worst life you might reasonably expect to have" (Molnar, 1985, p. 149). Respondents were required to mark the step which represented their assessment. A score of 10 indicates high satisfaction with life and a score of 1, low life satisfaction (see Appendix A, Item 70).

### Depression

Depression was assessed by means of ten items with wording adapted from Karasek (1979, p. 307); they combined to produce a composite score ranging from 0 to 10 (see Appendix A, Items 31-40). The respondent was required to choose between a pair of adjectives that described his life. The number of negative adjectives which were underlined constituted the score.

### Behavioural Outcomes

#### Propensity to Leave

Propensity to leave was adapted from Abdel-Halim (1980, p. 201). Answer 4 was changed from "consider taking it" to "take it" and descriptions of Answers 3 and 2 were added (see Appendix A, Item 16). A score of 1 indicated low propensity to leave while a score of 4 indicated high propensity to leave. The item was considered as a behavioural outcome, since it represents a behavioural intention.

### Tobacco Smoking

Tobacco smoking was assessed by means of one item written for this study (see Appendix A, Item 41). Tobacco smoking was included as a variable, since many studies have found that more strained people smoke more. However, it should also be noted that it has been implicated as a risk factor for CHD in many studies (Landsbergis, 1988).

### Alcohol Consumption

Alcohol consumption was assessed by means of two items adapted from Kessler, House and Turner (1987, p. 58). The score consisted of the product of the frequency of drinking in the last month and quantity consumed on one day. (See Appendix A, Items 42-43).

### Unpaid Leave

Data on absenteeism were gathered for each participant from organizational records for a sample period of two months. However, only 16 respondents had any data recorded and the sum of Unpaid Leave equalled 185 hours. Consultation with the custodians of the administrative system revealed that there was inconsistent utilization of this category across the organization. This raised concern over the validity of Unpaid Leave as a measure of absenteeism. For this reason, the data on Unpaid Leave were excluded from the analysis.

## Health Outcomes

### Somatic Complaints

Somatic complaints consisted of ten items from Caplan et al. (1980, pp. 271-272). Eight items assessed physical symptoms and two items assessed appetite and sleep disturbances (see Appendix A, Items 45-54). A score of 0 indicated no somatic complaints, while a score of 12 was the maximum.

### Recency of Dispensary Visits

An item enquiring about the recency of visits to the Company dispensary was derived from Caplan et al. (1980, p. 277), with the penultimate alternative deleted. The respondent was required to ring the appropriate time frame, which ranged from "within the past week" to "I have never gone there for anything". Scores ranged from 10 to 1. (See Appendix A, Item 55).

### Pill Consumption

Pill consumption was assessed by means of one item from Kessler et al. (1987, p. 58). In the present study, for purposes of analysis respondents were divided into those who did and those who did not (see Appendix A, Item 44).

### General Health

This variable was assessed by means of one item from Garrity et al. (1978, p. 75) similar to the General Well-Being rating and also developed from Cantril's (1965) item. It too, required respondents to mark the step on the ladder which corresponded to their

assessment of their general health. A rating of 10 represented the worst possible health and a rating of 1 represented the best possible health (see Appendix A, Item 56).

### **Sick Leave**

The data on the amount of sick leave taken by participants were obtained from organizational records and encompassed a two-month period.

### **Method of Analysis**

The analysis of the data was conducted in a number of phases. In the first phase, descriptive statistics were generated showing means, standard deviations and minimum and maximum values. Product moment correlation co-efficients between all variables in the study were calculated. On the basis of the information obtained from this step, certain variables were excluded from further analysis.

The second stage was to test for the moderating effects of the Sense of Coherence, Job Decision Latitude and Participation in Decision Making. A widely used technique to assess moderator effects is that of subgroup analysis (Zedeck, 1971). However, Bluen (1986) has identified two basic criticisms of the approach. Firstly, arbitrarily determined subgroups, e.g. a median split, increases the probability of obtaining spurious results. Second, "by reducing continuous data into discrete subgroups, measurement information is lost, and the decrease in sample size (necessitated by subgroup analysis) reduces the power of the statistical tests (1986, p. 207; see also Stone & Hollenbeck, 1984, p. 199).

Stone and Hollenbeck (1984) have argued that subgroup analysis is a far poorer procedure than conventional moderated multiple regression as a method for demonstrating moderator effects. It is regarded as conceptually and statistically more elegant. Moderated multiple regression constructs prediction equations over the total sample and adds to the information by including interaction terms. It aims to assess the contributions of the independent variables, moderator variables, and interaction terms to the variance in the dependent variables.

For each outcome variable in the present study stepwise multiple regressions were calculated. Equations which contained any interaction terms were then subjected to further analysis where the main effects were forced in. This was done since it is improper to consider an interaction effect without consideration of its component main effects. A significant interaction term by definition reflects a moderating role. A further step was to remove non-significant terms with a view to arriving at a model which permitted interaction effects in the presence of main effects to reach statistical significance. The final step was to fit a model to all outcomes and examine the change in variation explained and significance levels from the previous steps.

In their discussion of variable selection and model building, Montgomery and Peck preferred stepwise regression followed by backward elimination since "the backward elimination algorithm is often less adversely affected by the correlative structure of the regressors than forward selection" (1982, p. 278).

## CHAPTER 5

### RESULTS

This chapter will present the results obtained in the present study, firstly, in terms of descriptive statistics, secondly, in terms of product-moment correlations, and lastly, in terms of the regression analyses.

#### DESCRIPTIVE STATISTICS

Descriptive statistics for all variables in this study are presented in Table 1. These include for each variable, the mean, the standard deviation, the observed range and the possible range as well as the co-efficients alphas obtained for the relevant variables. The Kuder-Richardson 20 statistic was calculated, which is an accurate estimate of reliability (Magnusson, 1967, p. 166). The Kuder-Richardson 20 statistics ranged from .32 - .84. With the exception of somatic complaints (.32) and danger (.40), the other variables exhibited satisfactory reliabilities, considering the problem associated with the reliability of short scales. Inspection of Table 1 indicates that the observed range tended to be coincident with the possible range, suggesting few problems with restriction of range.

**Table 1 : Means, standard deviations and ranges for all study variables (N = 111)**

Variable	Mean	SD	Observed Range	Possible Range	Reliability of scale
Age	36.3	10.4	21- 60	Any Number	
Length of Service	7.2	7.2	1- 38.6	Any Number	
Quantitative Workload	12.8	3.4	5- 20	5- 20	.71
Role Ambiguity	7.0	3.3	4- 19	4- 20	.84
Danger	7.8	2.0	3- 10	2- 10	.40
Hours Worked	389.3	51.0	288-416	Any Number	
Overtime	61.9	53.4	0-199	Any Number	
Participation	9.4	3.4	3- 15	3- 15	.78
Decision Latitude	17.6	3.6	9- 28	7- 28	.61
Sense of Coherence	46.6	9.6	22- 65	12- 65	.84
Job Involvement	10.5	2.6	4- 16	4- 16	
Job Satisfaction	5.9	1.8	2- 8	2- 8	.82
Life Satisfaction	7.1	1.9	1- 10	1- 10	
Depression	1.9	2.6	0- 10	0- 10	.87
Propensity to Leave	2.0	1.0	1- 4	1- 4	
Tobacco Smoking	12.5	9.9	0- 40	Any Number	
Alcohol Consumption	9.9	19.9	0-120	Any Number	
Pill Consumption	1.1	0.3	1- 2	1- 2	
Dispensary Visits	3.3	2.8	2- 9	1- 10	
Somatic Complaints	1.7	1.9	0- 9	0- 12	.32
General Health	2.9	1.9	1- 9	1- 10	
Sick Leave	17.5	27.5	0-128.6	Any Number	

Note: General Health is reverse scored.

## PRODUCT-MOMENT CORRELATIONS

### Biographical Variables

Age and Length of Service were highly correlated  $r = 0.64$ ,  $p < 0.0001$ . (The degrees of freedom were 109 for all of these correlations and will not be repeated each time.) These variables were excluded from subsequent analyses and their correlations are not included in any tables. Age was significantly associated with Tobacco Smoking:  $r = -0.12$ ,  $p < 0.05$  implying that older people smoked less. This could reflect the fact that more older people had ceased smoking, or never developed the habit. It could also be the result of adaptation to a work environment wherein tobacco smoking is restricted and violations are subject to disciplinary action.

Age was also significantly associated with the SOC,  $r = 0.25$ ,  $p < 0.01$ . This means that increasing age was significantly associated with higher levels of the SOC. The most immediate explanation is the so-called "Survivor Hypothesis": older employees with a weak SOC may already have left the organisation. It may also reflect the fact that there was greater variability of levels of SOC amongst younger blue collar employees. Therefore, the relationship implies that older people have found meaning in their lives, have found their jobs and lives comprehensible and manageable and have chosen to remain in their jobs.

### Psychological Variables

Table 2 presents the correlations between the stressors and the outcome variables. There were extremely few significant associations between stressors and outcomes, although still more than would be expected by chance alone. A possible reason could be that the choice of independent variables did not adequately represent the relevant stressors for this sample.

Table 2 : Correlation matrix of stressors and outcomes (N = 111)

Variable	Quantitative Workload	Role Ambiguity	Danger	Hours Worked	Overtime
<u>Affective</u>					
Job Involvement	.04	-.22*	.11	.02	.07
Job Satisfaction	-.17	-.18	.05	.13	-.08
Life Satisfaction	.02	-.07	.12	-.08	.02
Depression	-.04	.04	-.10	-.05	.01
<u>Behavioural</u>					
Propensity to Leave	.07	.17	-.06	-.06	-.04
Tobacco Smoking	.07	.03	.05	-.03	.21
Alcohol Consumption	-.18	.15	.02	-.02	-.02
<u>Health</u>					
Pill Consumption	-.08	.10	-.16	-.32***	-.05
Somatic Complaints	.08	.01	-.002	-.16	-.03
Dispensary Visits	.03	.12	.04	-.08	.13
General Health	-.05	.09	-.02	-.04	-.04
Sick Leave	.03	.16	.06	-.35***	-.03

\* =  $p < .05$   
 \*\*\* =  $p < .001$

Table 3 presents the correlations between stressors and moderators. The variables were generally uncorrelated, supporting their independence of each other.

**Table 3 : Correlation matrix of stressors and moderators (N = 111)**

Variable	Quantitative Workload	Role Ambiguity	Danger	Hours Worked	Overtime
Participation	.19*	-.16	.11	-.02	-.15
Decision Latitude	.09	.07	.06	.07	.11
Sense of Coherence	-.03	-.14	.02	-.05	-.05

\* =  $p < .05$

The moderator variables were significantly related to each other. Participation in Decision Making had a correlation of  $r = 0.50$ ,  $p < 0.0001$ , with Job Decision Latitude. This implies that there was a strong relationship between participation, and perceived control over decisions and favourable task characteristics. Participation in Decision Making also evidenced a significant association with SOC,  $r = 0.20$ ,  $p < 0.05$ . This is interpreted to mean that higher levels of SOC were significantly related to higher levels of Participation in Decision Making. Job Decision Latitude correlated significantly with SOC,  $r = 0.41$ ,  $p < 0.0001$ . This implies that high levels of SOC were accompanied by high levels of reported Job Decision Latitude.

Table 4 presents the correlations between moderators and outcome variables. Inspection of Table 4 reveals that all of the moderators were significantly associated with affective outcome variables. All of the moderators were significantly associated with two of the health outcomes, i.e. Somatic Complaints and General Health, while none of them were significantly associated with Sick Leave. All three moderators were significantly associated with propensity to leave. In general, the moderators did not correlate with the other behavioural outcomes.

**Table 4 : Correlation matrix of moderators and outcomes (N = 111)**

Variable	Participation	Decision Latitude	Sense of Coherence
<u>Affective</u>			
Job Involvement	.49***	.53***	.43***
Job Satisfaction	.40***	.54***	.48***
Life Satisfaction	.27***	.38***	.63***
Depression	-.37***	-.44***	-.66***
<u>Behavioural</u>			
Propensity to Leave	-.24*	-.32***	-.47***
Tobacco Smoking	-.20*	.02	-.04
Alcohol Consumption	-.10	-.17	-.11
<u>Health</u>			
Pill Consumption	-.14	-.31***	-.28***
Somatic Complaints	-.25***	-.47***	-.55***
Dispensary Visits	-.21*	-.17	-.17
General Health	-.28***	-.29***	-.36***
Sick Leave	-.07	.03	-.14

\* = p <.05  
 \*\* = p <.01  
 \*\*\* = p <.001

Table 5 reveals that Tobacco Smoking and Alcohol Consumption were uncorrelated with any other variable.

Job Involvement was significantly correlated with all the other variables, as was Job Satisfaction, Depression, Propensity to Leave, General Health, and Somatic Complaints. Life Satisfaction correlated significantly with all other variables except for Dispensary Visits and Pill Consumption. Thus, all correlations were in the expected direction. It is noticeable that the high positive correlation between affective variables such as Life Satisfaction, Job Satisfaction and Job Involvement (ranging from  $r = 0.62$  to  $r = 0.46$ ) suggest that these variables may not, in fact, be independent of each other.

Table 5 : Interactions between Outcome Variables (N = 111)

	Job Involvement	Job Satisfaction	Life Satisfaction	Depression	Propensity to Leave	Tobacco Smoking	Alcohol Consumption	Sick Leave	General Health	Somatic Complaints	Dispensary Visits	Pill Consumption
Job Involvement	-											
Job Satisfaction	0.62***	-										
Life Satisfaction	0.46***	0.48***	-									
Depression	-0.46***	-0.53***	-0.62***	-								
Propensity to Leave	-0.25**	-0.52***	-0.25**	-0.41***	-							
Tobacco Smoking	-0.09	-0.01	-0.07	-0.03	0.003	-						
Alcohol Consumption	-0.13	0.03	-0.09	0.09	0.01	0.11	-					
Sick Leave	-0.02	-0.19*	-0.21*	0.21*	0.0001	0.04	-0.02	-				
General Health	-0.42***	-0.29**	-0.34***	0.24*	0.39***	0.08	0.12	0.10	-			
Somatic Complaints	-0.35***	-0.32***	-0.41***	0.48***	0.29**	0.02	0.19	0.13	0.39***	-		
Dispensary Visits	-0.27**	-0.25**	-0.13	0.12	0.26**	0.14	0.15	0.18	0.36***	0.22*	-	
Pill Consumption	-0.25**	-0.24*	-0.18	0.31**	0.21*	0.08	0.12	0.08	0.29*	0.46***	0.11	-

Note: General Health was reverse scored

\* = p < .05

\*\* = p < .01

\*\*\* = p < .0001

### REGRESSION ANALYSIS

Each outcome variable was regressed on the moderators, stressors and interactions, in order to assess the main effects of the independent variables, moderator variables, and the interactions. Thus 13 stepwise multiple regressions were constructed. If SOC, Job Decision Latitude and Participation in Decision Making appeared in interaction with the main effects there was no need to proceed to the next steps which forced in main and interaction effects. The regressions for the first and second step is appended (Appendix B). The third step removed variables in order to test whether interactions in the presence of their main effects reached statistical significance. The final step was to fit a model consisting of SOC, Job Decision Latitude, SOC x Job Decision Latitude to each outcome variable and compare the change in explained variation, changes in  $F$  or  $t$  statistics and probabilities. It should be noted that Role Ambiguity and Quantitative Workload were recoded for all multiple regression analyses to reverse the directions of their effects.

#### Affective Outcomes

Table 6 presents the two models for job involvement.

**Table 6 : Models for Job Involvement**

Criterion	Model	Predictor	Beta	$F$	$R^2$
Job Involvement	1	SOC	.026	0.17	22.6
		SOC x Role Ambiguity	.013	2.15	
		Role Ambiguity	-.749	3.13	
	2	SOC	-.051	0.127	34.8
		JDL	-.007	0.001	
		SOC x JDL	.007	1.81	

Note: JDL = Job Decision Latitude

Inspection of Table 6 reveals that no significant main or interaction terms exist. The second model, however, increased the proportion of explained variance by 12.2 percent.

Table 7 presents the models for Job Satisfaction.

**Table 7 : Models for Job Satisfaction**

Criterion	Model	Predictor	Beta	t	R <sup>2</sup>
Job Satisfaction	1	SOC x JDL	.004	-1.14	45.3
		SOC	.12	2.045*	
		Workload	.11	2.897**	
		JDL	.34	2.129*	
		PDM	.12	2.613*	
	2	SOC	0.141	2.319*	38.5
		JDL	0.432	2.612*	
		SOC x JDL	-0.005	-1.403	

Note: PDM = Participation in Decision Making

\* =  $p < .05$

\*\* =  $p < .01$

The first model explains 45.3 percent of the variation and the interaction is not significant. The loss of Workload and Participation in the second model results in a a loss of 6.7 percent of the explained variation. The second model thus retains explanatory power.

Table 8 presents the models for Life Satisfaction.

**Table 8 : Models for Life Satisfaction**

Criterion	Model	Predictor	Beta	<u>t</u>	R <sup>2</sup>
Life Satisfaction	1	SOC x JDL	.01	2.143*	45.3
		SOC	-.02	-0.258	
		Danger	-.13	-1.845	
		JDL	-.29	-1.646	
	2	SOC	.01	0.183	43.5
		JDL	-.21	-1.207	
		SOC x JDL	.01	1.723	

\*  $p < .05$

Only the interaction of SOC and JDL is significant in the presence of danger and the first model explains 45.3 percent of the variation. Although there is a tiny loss of explained variation (1.8 per cent) in the second model the interaction is no longer significant with the exclusion of Danger.

Table 9 presents the model for depression.

**Table 9 : Models for Depression**

Criterion	Model	Predictor	Beta	F	R <sup>2</sup>
Depression	1	SOC x PDM	.016	8.01**	52.9
		SOC	-3.06	32.21***	
		PDM	-4.37	12.20***	
	2	SOC	-0.32	16.24***	48.9
		JDL	-0.59	7.62**	
		SOC x JDL	0.01	4.683*	

\* =  $p < .05$   
 \*\* =  $p < .01$   
 \*\*\* =  $p < .0001$

There is loss of only 3 percent of explained variation when Job Decision Latitude replaced Participation. Thus, the second model remains a powerful model for predicting Depression. While the main effects were in the expected direction, the significant interaction, the moderator effect, was in the unexpected direction.

The effect of the interaction was plotted, a procedure suggested by Cohen and Cohen (1983). The graphs revealed that the best situation was the one wherein SOC and Job Decision Latitude were both very high. Even though the interaction worked in the opposite direction to the main effects, it reduced only the slope of the regression line and within the range of the two variables the slopes would not cross each other.

### Behavioural Outcomes

Table 10 presents the models for propensity to leave.

**Table 10 : Models for Propensity to Leave**

Criterion	Model	Predictor	Beta	<u>F</u>	R <sup>2</sup>
Propensity to Leave	1	SOC	-0.044	24.799***	25.14
		Role Ambiguity	-0.024	0.127	
		PDM	-0.030	0.078	
		PDM x Role Ambiguity	-0.001	0.007	
	2	SOC	-0.134	14.19***	28.84
		JDL	-0.293	9.21***	
		SOC x JDL	0.005	7.24***	

\*\*\* =  $p < .0001$

The second model increased the percentage of explained variation by 3.7 percent. While SOC and Job Decision Latitude main effects were significant and in the expected direction, the moderator effect was in the unexpected direction. The graphs were plotted and they revealed that a combination of high SOC and high Job Decision Latitude was best with respect to decreasing Propensity to Leave and the moderator effect only reduced the slope of the regression lines.

The regression models for Alcohol Consumption and Tobacco Smoking are appended (Appendix C). The models of step 3 only explained 8.13 percent and 8.25 percent of the variation, respectively, and were not analysed further.

### Health Outcomes

Table 11 presents the regression models for General Health.

**Table 11 : Models for General Health**

Criterion	Model	Predictor	Beta	<u>t</u>	R <sup>2</sup>
General Health	1	SOC x PDM	-0.0004	-0.077	17.5
		SOC	-0.058	-1.130	
		PDM	-0.097	-0.379	
	2	SOC	-0.158	-2.174*	17.1
		JDL	-0.363	-1.830	
		SOC x JDL	0.006	1.440	

\* =  $p < .05$

The second model reveals that when Job Decision Latitude replaced Participation, in the presence of SOC and the interaction term, the main effect of SOC was significant and there was a negligible loss of explained variation. General Health was reverse scored which meant that higher levels of SOC were significantly associated with self-perceptions of better general health.

Table 12 presents the regression model for Somatic Complaints.

**Table 12 : Model for Somatic Complaints**

Criterion	Model	Predictor	Beta	<u>F</u>	R <sup>2</sup>
Somatic Complaints	1	SOC x JDL	0.009	5.95*	40.9
		SOC	-0.233	13.79***	
		JDL	-0.558	10.70**	

\* =  $p < .05$

\*\* =  $p < .01$

\*\*\* =  $p < .0001$

Table 12 reveals that the main effect and the interaction effects were significant. Higher levels of the SOC and Job Decision Latitude were significantly associated with fewer somatic complaints. However, the moderator effect was in the unexpected direction. Again, graphs were plotted which revealed that while the effect reduced the slope of the regression line, within the range of the variables under consideration high SOC and Job Decision Latitude was the most favourable condition regarding levels of Somatic Complaints.

Table 13 presents the regression models for Pill Consumption

**Table 13 : Model for Pill Consumption**

Criterion	Model	Predictor	Beta	<u>t</u>	R <sup>2</sup>
Pill Consumption	1	SOC x JDL	-0.001	2.117*	16.3
		SOC	-0.029	-2.538*	
		JDL	-0.082	-2.669**	

\* =  $p < .05$

\*\* =  $p < .01$

Inspection of Table 13 reveals that the main effects of SOC and Job Decision Latitude are significant and in the expected direction. Again, the moderator effect is in the unexpected direction. Graphs were plotted which revealed that the interaction while reducing the slope of the regression line did not reduce the beneficial effect of high levels of SOC and Job Decision Latitude within the range of the variables under study.

The regression model for Sick Leave is appended (Appendix B) and not included here, since the regression model only accounted for 4.1 percent of the variation.

On the regressions of the eight outcomes presented above, the four significant interactions were in the unexpected direction. Mullet (1976) has identified four possible reasons why regression coefficients have the wrong sign: first, it could be that the range of regressors is too small; second, it is possible that important regressors have not been included in the model; third, computational errors may have occurred; and fourth, it is possible that multicollinearity exists.

Multicollinearity means that regressors are linearly related and that "inferences based on the regression model can be misleading or erroneous" (Montgomery & Peck, 1982, p. 287). Evidence of multicollinearity is found in situations wherein the overall  $F$  statistic is significant and the individual  $t$  statistics are not. Life satisfaction would be an example where the overall  $F$  statistic is significant at the 0.0001 per cent level, while the individual  $t$  statistics are not, notwithstanding the fact that 43.5% of the variance has been explained.

## CHAPTER 6

### DISCUSSION

This chapter contains a discussion of the results presented in the previous chapter, in terms of hypotheses stated earlier. The limitations of the study, its relevance and some indications for future research are also discussed.

### HYPOTHESES

#### Hypothesis 1

The first hypothesis stated that the organisational stressors will be significantly associated with health, affective, and organizational outcomes.

The correlational analysis disconfirmed this hypothesis. Only three out of sixty five possible relationships were significant. It should be noted though that the two moderators, Participation in Decision Making and Job Decision Latitude, contain elements of stressors. The content of participation can be construed as a work stressor when scored in reverse, while the Scale for Job Decision Latitude accessed four task characteristics (the job demands) whose presence or absence in varying amounts could also be construed as work stressors.

Brief and Atieh (1987) have criticized the procedure of researchers' a priori specification of stressful job conditions, suggesting instead the need to determine from workers themselves how

conditions at work are labelled. These findings are also typical of findings in organisational stress research that have led authors such as Payne, Jabri and Pearson (1988) to suggest that it is important to know the affective meaning of job demands. In terms of their analysis, the a priori specification of Danger, Quantitative Workload, and Role Ambiguity, number of Hours Worked and Overtime has not captured the stressors for this sample.

A second explanation could be the role of intervening variables such as personality characteristics, job characteristics and organisational culture which influence perceptions of stressors and outcomes. The subsequent hypotheses may throw more light on this issue.

### **Hypothesis 2**

Hypothesis 2 stated that the SOC will be significantly associated with perceptions of stressors. The hypothesis was derived from the proposition that personality predispositions influence perceptions of stressors and outcomes (Brief & Atieh, 1977; Kobasa, 1982; Watson & Clark, 1984). Inspection of Table 3 however, disconfirms this hypothesis, since the SOC has no significant correlations with any of the three psychosocial variables or with any of the two objective stressors.

On reflection, this result is not surprising, since the issue centers on the question whether the personality predisposition is expected to manifest itself in perceptions of stressors and/or

expected to manifest itself in perceptions of stressors and/or perceptions of outcomes. The data of this study suggest that persons with a strong SOC do not differ from persons with a low SOC in their assessment of work stressors, assuming that the stressor variables were acting as such. Alternatively, it may result from the possibility that the work stressors in this study were not relevant for the sample at hand.

### Hypothesis 3

Hypothesis 3 stated that the moderator variables will be significantly associated with the health, affective and behavioural outcome variables. Inspection of Table 4 reveals a number of significant associations between the three moderator variables and outcome variables. SOC and Job Decision Latitude correlated significantly with eight of the twelve outcome variables. There is thus substantial support for the proposition that SOC, Job Decision Latitude and Participation were strongly related to health and affective outcomes, and to a lesser extent, to behavioural outcomes.

Regarding the behavioural outcomes, it is noteworthy that five of nine possible relationships were not significant. Three of the remaining four significant relationships were with Propensity to Leave, a behavioural intention, which was self-reported. Tobacco Smoking and Alcohol Consumption as health outcomes needs to be explored and it is legitimate to ask whether significant associations with the moderator variables ought to have been expected.

Tobacco Smoking and Alcohol Consumption are both habits which participants have developed over time. Alcohol Consumption may be a symptom/reaction to stress, but only in the case of a very small number of respondents. These measures are, in the opinion of the author, different in aetiology and manifestation from the affective and health outcomes. The utility of these two measures as behavioural outcome variables needs to be assessed in the light of the fact that Tobacco Smoking and Alcohol Consumption have typically been used in occupational stress research as risk factors in studies seeking to demonstrate links between occupational stress and incidence of and development of CHD, rather than as outcomes associated with stress.

The organization where the study was conducted, has estimated that alcohol abuse loses the organization in excess of R20m per annum due to lost productivity. Consequently, a major employee assistance programme is envisaged. There is, thus, considerable evidence to suggest that excessive alcohol consumption is prevalent. Consequently, a second reason proffered by the author, is that Alcohol Consumption may have been under-reported for reasons related to mistrust by respondents of the assurance of confidentiality.

The multiple regression analyses explored main effects and interaction effects of the independent variables and the moderator variables on the affective, behavioural and health outcomes. These analyses, thus, further explored and tested the relationships

between the moderator variables and the outcome variables. Tables 6-13 contain the relevant information.

#### Affective Outcomes

Regarding the affective outcomes, SOC had significant main effects on Job Satisfaction and Depression, implying that higher levels of SOC were associated with lower levels of Depression and higher levels of Job Satisfaction. There were however, no significant main effects on Job Involvement and Life Satisfaction, despite the variance accounted for (34.8 percent and 43.5 percent, respectively).

Multicollinearity has already been mentioned as a possible explanation for situations where the overall  $F$  statistic is significant, but the individual  $t$  statistics are not. Table 5 revealed that all of the affective outcome variables were significantly intercorrelated ( $p < 0.0001$ ). A second reason may be incomplete model specifications. Life Satisfaction, for example, may be a multi-dimensional construct and the absence of other non-work sources of stress, e.g. marital relationships, social relations, career issues, etc. may mean that SOC in the absence of other relevant variables did not account significantly for the variation in Life Satisfaction.

The same logic may be applied to explaining why SOC did not significantly account for the variation in the extent to which participants psychologically identified with their work. Role

Ambiguity was the only organizational stressor which correlated significantly with Job Involvement and this would suggest that other role related variables are important determinants of job involvement. This implies that other important determinants of job involvement were not specified and that SOC, in the absence of these factors does not significantly account for the variation.

Participation featured in the predictions of Job Satisfaction and Depression, but not in the predictions of Life Satisfaction or Job Involvement. As discussed above, Life Satisfaction and Job Involvement may require the specification of other additional variables.

Main effects of Job Decision Latitude were also evidenced in Job Satisfaction and Depression, but not for Job Involvement and Life Satisfaction. This means that a combination of task characteristics and control over decisions have implications for reported levels of job satisfaction and reported depression. It is suggested that irrespective of the source of depression, work and non-work perceptions influence each other and this would account for less desirable task characteristics and less control being reported. The result regarding Job Satisfaction is consistent with findings of Landsbergis (1988) and McLaney and Hurrell (1988) who found significant main effects for job demands and control variables on Job Satisfaction.

The absence of significant main effects on Life Satisfaction and Job Involvement in spite of the highly significant correlations between Job Decision Latitude and these variables, could again be ascribed to the omission in this study of other relevant variables. It is also possible that truncation of distributions, viz. the average levels of Job Involvement and low-to-average levels of Job Decision Latitude reported by this sample affected the relationships between these two variables.

#### **Behavioural Outcomes**

Regarding the behavioural outcomes, only the regression of Propensity to Leave on the moderator variables and the independent variables was significant. Significant main effects were observed for SOC and Job Decision Latitude, but not for Participation. The SOC main effect could be attributed to the survivor hypothesis mentioned earlier, according to which it could be proposed that persons high in SOC fit into their existing jobs and into the organization, while those low in SOC may have left, or that those high in SOC who were dissatisfied may also have elected to leave the organization.

Increased levels of Job Decision Latitude were also significantly associated with decreased Propensity to Leave the organization. This finding confirms the relationship between favourable job characteristics and control over decisions and positive outcomes associated with active jobs according to Karasek's (1979) model, (see Figure 2).

### Health Outcomes

Regarding the health outcomes, SOC was significantly associated with less Pill Consumption, fewer Somatic Complaints and more positive ratings of General Health ( $p < 0.0001$ ). The same pattern obtained for Job Decision Latitude. Neither of the variables were related to Dispensary Visits and Sick Leave. Participation in Decision Making was significantly associated with Somatic Complaints and General Health ( $p < 0.0001$ ) and Dispensary Visits ( $p < 0.05$ ).

The regression analyses revealed main effects of SOC on General Health, Somatic Complaints and Pill Consumption. These findings are consistent with the health promoting effects of SOC. Job Decision Latitude had significant main effects on Somatic Complaints and Pill Consumption which is consistent with evidence provided by Karasek (1979) regarding pill consumption, and evidence provided by Payne and Fletcher (1983) regarding somatic symptoms. These findings can be interpreted to mean that a relationship between job properties, in the form of Job Decision Latitude, and physical health, in the form of fewer Somatic Complaints and less pill consumption, existed in the presence of the SOC.

The study was unable to confirm significant links between Job Decision Latitude, SOC and General Health ratings. This was in spite of the significant  $F$  statistic which was obtained for the overall analysis of variance. Again, the author is forced to accept that common methods variance and multicollinearity were sources of the problem.

#### Hypothesis 4

Hypothesis 4 stated that the SOC, Job Decision Latitude and Participation in Decision Making would moderate the relationship between stressors and outcomes.

Of the eight possible outcomes where moderator effects were tested, there were significant interactions between SOC and Job Decision Latitude in half of them. The moderator effects were in the unexpected direction. While the main effects operated in the expected direction, i.e. they were associated with less Depression, less Propensity to Leave, fewer Somatic Complaints and less Pill Consumption, the moderator effects were significantly associated with the opposite trends.

In spite of the interaction terms achieving statistical significance, the moderator effects would not have significantly altered the slopes of the prediction equations within the range of the variables in the study. This is interpreted to mean that the main effects of SOC and Job Decision Latitude influenced the outcomes more strongly than their interaction effects. Situations wherein high Job Decision Latitude and high levels of SOC occurred were demonstrated to be better than situations wherein low Job Decision Latitude and low levels of SOC occurred, with respect to strain outcomes.

Whilst the equivocal evidence for the moderating effects of Job Decision Latitude are consistent with results of Landsbergis (1988),

McLaney and Hurrell (1988), and Spector (1987), the measure of Job Decision Latitude used in this study differed from previous studies insofar as the single measure was a composite of demand and control items.

The findings insofar as they refer to the role of SOC, appear to support the direct rather than the moderating effects of SOC on strain related outcomes. Further interpretation of the effects of SOC led to the conclusion that the personality predisposition appears to have had salutary effects on a variety of affective and health outcomes, and to a lesser extent on the behavioural outcomes. Specifically, SOC had direct effects on Job Satisfaction, Depression, Propensity to Leave, General Health ratings, Somatic Complaints and Pill Consumption.

#### **LIMITATIONS OF THE STUDY**

There are several limitations of this study and these need to be made explicit so that the interpretations and the inferences relating to the usefulness of the study can be considered against this background.

Firstly, the design was cross-sectional and this implies that inferences about causality are impossible. Also, measurement at a single point in time cannot give any indication of the chronicity of life or work stress that a person is or has been subjected to. House (1987) has criticized stress research for its lack of attention to

the differences between chronic stress, which endures over a number of years and can be implicated in the development of chronic disease, and acute or transient stress, which may produce temporary psychological and physiological effects. Payne, Jick and Burke (1982) have also argued that health outcomes appear more likely to result from chronic stress. The study was, therefore, unable to address the issue of acute or chronic stress. It assumed, however, that the SOC, given in relation to health and well-being had effects irrespective of the duration or type of stress episode. This was, in fact, supported.

Secondly, the design utilized a non-random sample which implies that the generalizability of the findings is restricted to this sample of blue collar workers only.

Thirdly, all the psychological variables were measured in the same questionnaire. This implies that common methods variance and multicollinearity were problems for this study. For example, the relationship between Job Decision Latitude and Participation in Decision Making was  $r = 0.50$ ,  $p < 0.0001$ , and the relationship between SOC and Job Decision Latitude was  $r = 0.42$ ,  $p < 0.0001$ . This was also reflected in the moderator analysis wherein Job Decision Latitude substituted for Participation in Decision Making with only small losses in explained variations. The correlations between the affective and health outcome variables (see Table 5) also provided evidence for the presence of multicollinearity and common methods variance.

### RELEVANCE OF THE STUDY

The study has demonstrated relationships between Participation in Decision Making, and Job Decision Latitude with various affective, health and behavioural outcomes in terms of the stress-strain process. It has highlighted some practical and important implications of concepts such as participation in decision making, various job demands and control over decision making.

The study has also filled a gap in the literature by utilizing a personality factor, the SOC, and exploring its role in the work-related stress-strain process. The direct effects of this personality predisposition seem to outweigh its moderating effects, but the omission of consideration of personality measures from future occupational stress research would seem to be a serious omission. It would appear that the SOC is an important factor in determining a person's vulnerability/invulnerability to stress at work.

These two aspects above, would suggest that a stress framework may be useful for understanding organisational problems and clarify the need for certain policies and their application. From a human resources management perspective, processes such as selection, manpower utilisation and management styles need to be integrated. In the author's opinion, it would seem as if the sense of coherence could have implications for selection and individual adaptation to the work situation. Similarly, the job demands, participation in

decision making and control over decision making have important implications for company policies, management styles and practices. This matter would direct attention to the required balance between individual coping strategies and organizational change/prevention strategies.

#### IMPLICATIONS FOR FUTURE RESEARCH

Two related directions for further research are implied by this study. The first relates to job stressors and their relationship to psychological and behavioural outcomes. The second relates to the SOC.

Payne et al. (1988) found that the ratings of the presence of job demands, and the ratings of satisfaction with those demands varied across individuals. These findings are important since it has already been pointed out that job stressors may be contextual and sample-dependent. Instead of specifying work stressors a priori, Payne et al. (1988) have urged researchers to adopt a procedure which, firstly, identifies the presence of attritional job demands, and secondly, identifies the levels of satisfaction which individuals express with those demands. This strategy would avoid assuming that all demands are stressful for all persons, and would result in the exploration of the affective meaning of job demands.

In support of this argument, the type of production process, for instance, presents workers with very different combinations of

task characteristics, opportunities for participation and control, and this fact alone would account for differing perceptions as to what constitutes stress at work. Salvendy's classification of forms of machine-paced and human-paced work (cited in Smith, 1985) would, for instance, have implications for the understanding of job demands.

The second line of research requires that the SOC be linked to improved behavioural strain outcomes, in ways which would indicate whether a strong SOC is related to task performance in ways superior to those of people low in SOC. If these links were to be demonstrated, it would be useful to explore the processes whereby strong SOC people establish order out of chaos and reduce the entropy in their lives, in order to isolate and identify adaptative appraisal and coping strategies which can be shared with highly stressed persons.

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APPENDIX A

Covering Letter and Questionnaire "You and Your Work"

JULY 1988

Dear respondent

I am currently busy working on a thesis and am seeking your support to help complete the research.

The research project aims to investigate stress at work among I, J, and K grade operators at ..... It seeks information on how you perceive aspects of your work, your views on your health, and some events in general. It will also collect information from organizational records.

At the end of the project all I, J, and K grade operators at Modderfontein will receive a brief summary of the main findings of the research. All the completed questionnaires will be treated as strictly confidential and the information will be used for research purposes only. Managers will not have access to the information on the questionnaires, which will after data analysis be destroyed.

The questionnaire will take you @25 minutes to complete. Your cooperation, in giving of your time, is greatly appreciated by myself. Kindly place completed questionnaires into the addressed envelopes, seal them and return to ..... at .....

Thank you for your time and effort.

Gary Anstey  
Training and Development (x2657)

YOU AND YOUR WORK

Age: \_\_\_\_\_ years

No: \_\_\_\_\_

Grade: I \_\_\_\_\_ J \_\_\_\_\_ K \_\_\_\_\_

INSTRUCTIONS:

This form contains questions and descriptions about your work and your health. For most questions you have 4 or 5 answers to choose from. Please circle the number of the answer that describes you or your work situation best.

Examples:

1. Is your work interesting?

Rarely or never	Occasionally	Sometimes	Fairly Often	Very Often
1	2	3	4	5

Depending on how you feel about your work, you can choose any one of the 5 answers and then circle the number of that answer.

Suppose you think that your work is "very often" interesting, you would circle "5" like this:

Very Often

⑤

If you feel differently, you would circle the number which best expresses your feeling.

2. I feel bored with my work.

Very Often	Fairly Often	Sometimes	Occasionally	Rarely or never
5	4	3	2	1

Suppose you only "rarely or never" feel bored with your work, your answer would be:

Rarely or never

①

Or if you think that you are "fairly often" bored with your work, your answer would be:

Fairly Often

④

Always choose the answer that describes you or your job best. Please give only one answer to each question. Please do not leave out any questions.

Now go on from here.

QUESTIONS

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

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
5	4	3	2	1
  
2. How often does your job require you to work very hard?
 

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
5	4	3	2	1
  
3. How often does your job leave you with little time to get things done?
 

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
5	4	3	2	1
  
4. How often is there a great deal to be done?
 

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
5	4	3	2	1
  
5. The most important things that happen to me involve my job.
 

Agree strongly	Agree	Disagree	Disagree strongly
4	3	2	1
  
6. I live, eat and breathe my job.
 

Agree strongly	Agree	Disagree	Disagree strongly
4	3	2	1
  
7. I am very much personally involved in my work.
 

Agree strongly	Agree	Disagree	Disagree strongly
4	3	2	1

8. The major satisfactions in my life come from my job.

Agree strongly	Agree	Disagree	Disagree strongly
4	3	2	1

9. How dangerous do you think your job is?

Not at all	Slightly	Somewhat possibility of bruising or discomfort	Possibility of serious injury	Very dangerous life threaten- ing
1	2	3	4	5

10. How often do you think of the danger in (9)?

Less than once per month	Once per month	Once per week	Once per day	More than once per day
1	2	3	4	5

11. Of the people you supervise, about how many do you feel are doing the best work they can in their jobs?

Almost none of them	Some of them	About half of them	Most of them	Nearly all of them
1	2	3	4	5

12. How often are you clear on what your job responsibilities are?

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
1	2	3	4	5

13. How often can you predict what others will expect of you on the job?

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
1	2	3	4	5

14. How much of the time are your work objectives clearly defined?

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
1	2	3	4	5

15. How often are you clear about what others expect from you on the job?

Very Often	Fairly Often	Sometimes	Occasionally	Rarely
1	2	3	4	5

16. If another company were to offer you a job with just the same responsibilities and pay that you now have, how seriously would you consider changing companies?

I would be very interested in such an offer and would definitely take it	I would be interested and perhaps take it	I would think about it but probably not take it	The offer would not interest me at all
4	3	2	1

17. How much do you take part with others in making decisions that affect you?

A great deal	A Lot	Some	A little	Very little
5	4	3	2	1

18. How much do you participate with others in helping set the way things are done on your job?

A great deal	A Lot	Some	A little	Very little
5	4	3	2	1

19. How much do you decide with others what part of a task you will do?

A great deal	A Lot	Some	A little	Very little
5	4	3	2	1

20. At work I have the right to decide when I want to do what.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
4	3	2	1

21. At work I am expected to learn new things.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
4	3	2	1

22. At work I have to do the same tasks over and over.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
1	2	3	4

23. At work everything is decided higher up, above me.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
1	2	3	4

24. My job requires a high level of skill and training.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
4	3	2	1

25. My job leaves no room for originality.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
1	2	3	4

26. At work I have the freedom to decide how I want to do my job.

That is really how it is	That is close to how it is	That is far from how it is	That is not at all how it is
4	3	2	1

27. If you think back over the last 2 months, how serious would you say were your problems at work that you could ascribe to the fact that you are a black operator, which a white operator would not have experienced?

Did not occur or not impor- tant in my situation	Minor irrit- ation	Serious but I can handle it	Serious, at times I can't handle it	Very serious I just about can't handle it
1	2	3	4	5

28. How many times over the last 2 months have you experienced problems at work that you could ascribe to the fact that you are a black operator? (Write number) \_\_\_\_\_ times.

29. All in all, how satisfied are you in your present job?

Not at all satisfied	Not too satisfied	Somewhat satisfied	Very satisfied
1	2	3	4

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

1. I would definitely decide not to take the job.
2. I would have second thoughts, probably not.
3. I would have some second thoughts but probably take it.
4. I would decide without hesitation to take the same job.

For number 31 to 40, underline the word which describes best how your life is.

31. My life is ..... boring OR interesting
32. My life is ..... enjoyable OR miserable
33. My life is ..... easy OR hard
34. My life is ..... useless OR worthwhile
35. My life is ..... friendly OR lonely
36. My life is ..... full OR empty
37. My life is ..... discouraging OR hopeful
38. My life is ..... tied down OR free
39. My life is ..... disappointing OR rewarding
40. My life is ..... brings out best OR doesn't bring out best
41. If you smoke, how much do you smoke? (if you do not, write 0)  
I smoke \_\_\_\_\_ cigarettes or pipes per day.
42. About how often did you drink in the last month - how many days out of 30? \_\_\_\_\_ days.
43. When you drink, about how many glasses of beer, magou (mageu, mahewu), or wine, or tots of hard liquor do you have in one day?  
\_\_\_\_\_ drinks.

44. How often in the past month did you find it necessary to take tablets or other drugs to help you go to sleep - how many days out of 30?  
 \_\_\_\_\_ days.

For numbers 45 to 54: Have you experienced any of the following during the past month on the job? Make an X in front of those you have experienced during the last month.

- 45. \_\_\_\_\_ Your hands trembled enough to bother you.
- 46. \_\_\_\_\_ You were bothered by shortness of breath when you were out working hard or exercising.
- 47. \_\_\_\_\_ You were bothered by your heart beating hard.
- 48. \_\_\_\_\_ Your hands sweated so that you felt damp and clammy.
- 49. \_\_\_\_\_ You had spells of dizziness.
- 50. \_\_\_\_\_ You were bothered by having an upset stomach or stomach ache.
- 51. \_\_\_\_\_ You were bothered by your heart beating faster than normal.
- 52. \_\_\_\_\_ You were in ill health which affected your work.

In addition, did you experience either one of the following during the past month?

53. You had loss of appetite.

Never	Once or twice	Three or more times
1	2	3

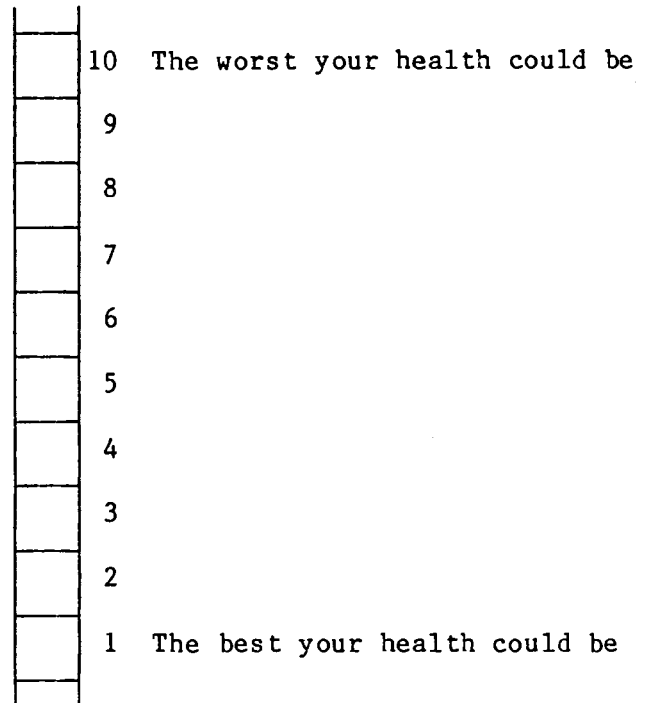
54. You had trouble sleeping at night.

Never	Once or twice	Three or more times
1	2	3

55. When was the last time you made use of the medical or health services here at work other than for a routine physical exam (for example, to get an aspirin for a headache, to take care of a sore muscle, injury or other discomfort)? (Make an X in one of the squares (Ignore numbers in brackets).).

- Within the past week  (10)
- 2 weeks ago  (9)
- 3 weeks ago  (8)
- 1 month ago  (7)
- 2 months ago  (6)
- 3 months ago  (5)
- 4 months ago  (4)
- 5 months ago  (3)
- 6 months ago or longer  (2)
- I have never gone there for anything  (1)

56. If the "ladder" drawn below, with it's 10 steps numbered, represents your general health, indicate the "step" on which you would place yourself currently. Circle the number of the step you would choose.



57. Do you have the feeling that you don't really care about what goes on around you?

Very seldom  
or never

Very often

5

4

3

2

1

58. Has it happened in the past that you were surprised by the behaviour of people whom you thought you knew well?
- |  |                         |   |   |            |
|--|-------------------------|---|---|------------|
|  | Very seldom<br>or never |   |   | Very often |
|  | 5                       | 4 | 3 | 2          |
|  |                         |   |   | 1          |
59. Has it happened that people whom you counted upon disappointed you?
- |  |             |   |   |            |
|--|-------------|---|---|------------|
|  | Very seldom |   |   | Very often |
|  | 5           | 4 | 3 | 2          |
|  |             |   |   | 1          |
60. Until now your life has had:
- |  |                                     |   |   |                                 |
|--|-------------------------------------|---|---|---------------------------------|
|  | No clear goals or<br>purpose at all |   |   | Very clear goals<br>and purpose |
|  | 1                                   | 2 | 3 | 4                               |
|  |                                     |   |   | 5                               |
61. Do you have the feeling that you are being treated unfairly?
- |  |            |   |   |                         |
|--|------------|---|---|-------------------------|
|  | Very often |   |   | Very seldom<br>or never |
|  | 1          | 2 | 3 | 4                       |
|  |            |   |   | 5                       |
62. Do you have the feeling that you are in an unfamiliar situation and don't know what to do?
- |  |            |   |   |                         |
|--|------------|---|---|-------------------------|
|  | Very often |   |   | Very seldom<br>or never |
|  | 1          | 2 | 3 | 4                       |
|  |            |   |   | 5                       |
63. Doing the same things you do every day is:
- |  |  |   |   |                                 |
|--|--|---|---|---------------------------------|
|  | A source of deep<br>pleasure and<br>satisfaction |   |   | A source of pain<br>and boredom |
|  | 1  | 2 | 3 | 4                               |
|  |  |   |   | 5                               |
64. Do you have very mixed-up feelings and ideas?
- |  |            |   |   |                         |
|--|------------|---|---|-------------------------|
|  | Very often |   |   | Very seldom<br>or never |
|  | 1          | 2 | 3 | 4                       |
|  |            |   |   | 5                       |

65. Does it happen that you have feelings inside that you would rather not feel?
- |  |            |   |   |                         |
|--|------------|---|---|-------------------------|
|  | Very often |   |   | Very seldom<br>or never |
|  | 1          | 2 | 3 | 4                       |
|  |            |   |   | 5                       |
66. Many people - even those with strong characters - sometimes feel like losers or blunderers ("sad sacks") in certain situations. How often have you felt like this?
- |  |       |   |   |            |
|--|-------|---|---|------------|
|  | Never |   |   | Very often |
|  | 5     | 4 | 3 | 2          |
|  |       |   |   | 1          |
67. When something happened, have you generally found that:
- |  |  |   |   |  |
|--|--|---|---|--|
|  | You overestimated<br>or underestimated<br>its importance |   |   | You saw things in<br>a balanced pers-<br>pective (in the<br>right proportion |
|  | 1  | 2 | 3 | 4  |
|  |  |   |   | 5  |
68. How often do you have the feeling that there is little meaning in the things you do in daily life?
- |  |            |   |   |                         |
|--|------------|---|---|-------------------------|
|  | Very often |   |   | Very seldom<br>or never |
|  | 1          | 2 | 3 | 4                       |
|  |            |   |   | 5                       |
69. How often do you have feelings that you are not sure you can keep under control?
- |  |            |   |   |                         |
|--|------------|---|---|-------------------------|
|  | Very often |   |   | Very seldom<br>or never |
|  | 1          | 2 | 3 | 4                       |
|  |            |   |   | 5                       |

70. If the "ladder" drawn below, with it's 10 steps numbered, represents your general life satisfaction, indicate the "step" on which you would place yourself currently. Circle the number of the step you would choose.

	10	the best life you may reasonably expect to have
	9	
	8	
	7	
	6	
	5	
	4	
	3	
	2	
	1	the worst life you may reasonably expect to have

THANK YOU FOR YOUR PARTICIPATION

APPENDIX B

Step Two Multiple Regression Models with Forced In Main and Interaction Effects.

Criterion	Predictor	Beta	t	Prob	ITI	R <sup>2</sup>
Job Description	SOC x JDL	-0.003	-1.017	0.3115		46,76***
	SOC	0.110	1.885	0.0622		
	Quantitative Workload	0.292	2.583	0.0112		
	JDL	0.318	2.006	0.0474		
	PDM x Quantitative Workload	-0.019	-1.687	0.0946		
	PDM	0.285	2.635	0.0097		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	t	Prob	ITI	R <sup>2</sup>
Life Satisfaction	SOC x JDL	0.007	1.905	0.0595		45.76***
	SOC	-0.005	-0.052	0.9585		
	Danger	-0.462	-1.199	0.2334		
	JDL	-0.569	-1.436	0.1541		
	JDL x Danger	0.017	0.792	0.4300		
	SOC x Danger	-0.6004	-0.058	0.9535		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	F	Prob	ITI	R <sup>2</sup>
Job Involvement	SOC	0.0256	0.17	0.6884		22.6***
	SOC x Role Ambiguity	0.0129	2.15	0.1458		
	Role Ambiguity	-0.7486	3.13	0.0796		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	F	Prob	ITI	R <sup>2</sup>
Depression	SOC x PDM	0.0156	8.01	0.0056		52.88***
	SOC	-0.3057	32.21	0.0001		
	PDM	-0.9376	12.20	0.0007		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	t	Prob	ITI	R <sup>2</sup>
Tobacco Smoking	SOC	0.175	0.564	0.5741		8.68
	SOC x Quantitative Workload	0.007	0.123	0.9021		
	Quantitative Workload	-0.873	-0.302	0.7635		
	JDL	0.392	0.452	0.6520		
	PDM	-0.923	-2.804	0.0060		
	JDL x Quantitative Workload	0.104	0.616	0.5396		
	SOC x JDL x Quantitative Workload	-0.002	-0.692	0.4904		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	t	Prob	ITI	R <sup>2</sup>
Alcohol Consumption	Quantitative Workload	1.048	1.927	0.0567		8.13
	Role Ambiguity	0.415	0.160	0.8735		
	JDL	0.281	0.135	0.8928		
	JDL x Role Ambiguity	-0.077	-0.531	0.5966		

Criterion	Predictor	Beta	F	Prob	ITI	R <sup>2</sup>
Propensity to Leave	SOC	-0.0439	-4.979	0.0001		25.15***
	Role Ambiguity	-0.2459	-0.357	0.7218		
	PDM	-0.0305	-0.280	0.7799		
	PDM x Role Ambiguity	-0.0006	-0.084	0.9336		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	F	Prob	ITI	R <sup>2</sup>
Pill Consumption	SOC x JDL	0.001	1.778	0.0783		17.24***
	SOC	0.026	-2.202	0.0297		
	JDL	-0.073	-2.302	0.0233		
	Danger	0.015	1.126	0.2625		

\*\*\* =  $p < .01$

Criterion	Predictor	Beta	<u>t</u>	Prob	ITI	R <sup>2</sup>
General Health	SOC x PDM	-0.0004	-0.077	0.9391		17.48***
	SOC	-0.0584	-1.130	0.2611		
	PDM	-0.0977	-0.379	0.7052		

\*\*\* =  $p < .0001$

Criterion	Predictor	Beta	<u>t</u>	Prob	ITI	R <sup>2</sup>
Sick Leave	SOC	0.080	0.053	0.9575		4.12
	SOC x Role Ambiguity	-0.029	-0.284	0.77773		
	Role Ambiguity	0.129	0.026	0.9790		

APPENDIX C

Regression Models for Alcohol Consumption and Tobacco Smoking

Criterion	Model	Predictor	Beta	t	R <sup>2</sup>
Alcohol Consumption	1	Quantitative Workload	1.048	1.927	8.13
		Role Ambiguity	0.419	0.160	
		JDL	0.281	0.135	
		JDL x Role Ambiguity	-0.076	-0.531	
	2	SOC	-0.311	0.368	3.1
		JDL	-1.387	-0.605	
		SOC x JDL	0.012	-0.255	

Criterion	Model	Predictor	Beta	t	R <sup>2</sup>
Tobacco Smoking	1	SOC	-0.051	-0.476	7.65
		Quantitative Workload	-0.323	-1.172	
		JDL	0.525	1.623	
		PDM	-0.918	-2.517**	
	2	SOC	0.322	0.756	3.4
		JDL	1.159	1.001	
		SOC x JDL	-0.222	-0.922	

\*\* =  $p < .01$