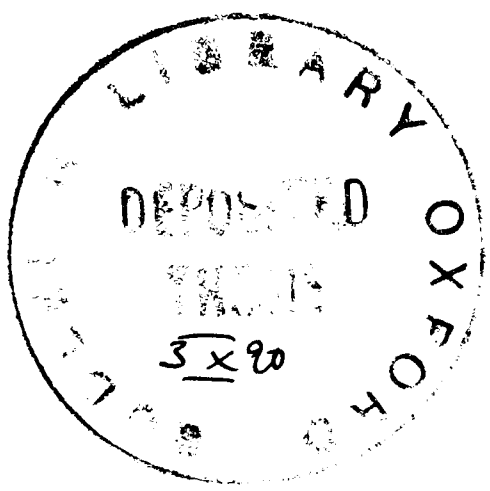
STRESS, INDIVIDUAL DIFFERENCES,

AND

SOCIAL SUPPORT



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To My Mother, Lin Qi, Táng

CONTENTS

Abstract i
Acknowledgements ii
Extended Abstract iii

Chapter One

CONCEPTS AND METHODS IN THE STUDY OF STRESS

Summary 1

1.1 Introduction: The Concept of Stress 2

1.2 Problems of Conceptual Definition and Usage 2

1.2.1 Stress as a Stimulus. 4
1.2.2 Stress as a Response 6
1.2.3 Theoretical Issues: Stimulus and Response Definitions of Stress 7
1.2.4 Stress as a Reaction Between Person and Environment. 9

1.3 Approaches to the Study of Occupational Stress. 11

1.3.1 Role Stress Theory 11
1.3.2 Demand-Control Theory. 13
1.3.3 Person-Environment Fit Theory 17
1.3.4 The House Model 20

1.4 Methodology Issues in Research 27

1.4.1 Cross-Sectional versus Longitudinal Research. 27
1.4.2 Measurement of Variables 30
1.4.3 Measures of Stress Outcome. 38

1.5 Comment and Conclusions 40

Chapter Two

STRESS AT WORK: A REVIEW OF THE LITERATURE

Summary 42

2.1 Introduction 43

2.2 Research on Work Environmental Stressors 44

2.3 Individual Differences in the Stress Process 50

2.3.1 Personality Dispositions and Perceptions of Stress at Work 52

2.4 Individual Differences as Moderators of Stress and Illness 60

2.5 Social Support as a Resistance Resource 71

2.5.1 Introduction 71
2.5.2 The Concept of Social Support 72
2.5.3 The Measurement of Social Support 74
2.5.4 The Main versus Buffering Effect Hypothesis 79
2.5.5 Evidence for Main and Buffering Effect Models of Social Support 82
2.5.6 Social Support and Individual Differences 85

2.6 Overview and Aims of Present Research 89

Chapter Three

PRESENT STUDIES: OVERVIEW OF PSYCHOMETRIC CHARACTERISTICS OF WORK, PERSONALITY AND MENTAL HEALTH MEASURES

Summary 92

3.1 Assessment of Variables 93

3.1.1 The Work Environment 93
3.1.2 Individual Differences 97
3.1.3 Outcome Measures 99

3.2 Statistical Analysis 101

3.3 Results 103

3.4 Discussion 114

Chapter Four

SOCIAL SUPPORT AND WELL-BEING AMONG SMALL ENTERPRISE OWNERS AND EMPLOYEES

Summary 116

4.1 Introduction 117

4.2 The Present Study 118

4.3 Method 122

4.4 Measures 124

4.4.1 Perceived Work Environment 124
4.4.2 Personality Characteristics 125
4.4.3 Measures of Outcome 126
4.4.4 Further Information 127

4.5 Statistical Treatment. 128

4.5.1 Data Analysis: Part One 128
4.5.2 Data Analysis: Part Two 128

4.6 Results 131

4.6.1 Descriptive Data 131
4.6.2 Discriminant Analysis 133
4.6.3 Personality and Social Support: Intercorrelations of Measures 137
4.6.4 Multiple Regression Analysis 139

4.6.4.1 Prediction of Social Support from Personality Factors 139
4.6.4.2 Prediction of Outcome Measures 144
4.6.4.3 Prediction of GHQ. 143
4.6.4.4 Prediction of Job Satisfaction 154
4.6.4.5 Further Exploratory Analyses 157

4.7 Discussion 162

4.7.1 Occupational Differences: Employees and Entrepreneurs 162
4.7.2 Personality Factors and Social Support. 163
4.7.3 Social Support and the Buffering Hypothesis 166

Chapter Five

TRANSITION FROM EDUCATION TO WORK: A LONGITUDINAL STUDY

Summary 170

5.1 Introduction 171

5.2 Method 177

5.3 Assessment of Variables 177

5.4 Statistical Treatment. 179

5.5 Results 183

5.5.1 Changes in Work Demands, Social Support and Health-Related Outcomes Between Time 1 and Time 2 185
5.5.2 Cross-Sectional Analysis of Time 1 and Time 2 Data 187
5.5.3 Longitudinal Analysis: Time 1 and Time 2 Data 204
5.5.4 Personality Variables as Stress Moderators 211

5.6 Discussion 221

5.6.1 Changing Levels of Work Demands and Psychological Health Between Time 1 and Time 2 222
5.6.2 Social Support as a Stress Moderator 224
5.6.3 Work Stressors: Job Demand and Job Discretion 227
5.6.4 The Johnson-Hall Demand-Control-Support Model of Work Stress . . . 228
5.6.5 Some Implications for the Design of Jobs. 232
5.6.6 Negative Affectivity, Perceived Demand and Psychological Health . . . 233
5.6.7 Individual Differences in Reactivity to Work Stress. 235

Chapter Six

GENERAL DISCUSSION AND CONCLUSIONS

6.1 Introduction 238

6.2 Social Support and Psychological Well-Being 239

6.3 Individual Differences and Social Support 241

6.4 The Timing of Social Support 243

6.5 Environmental Factors and Well-Being 244

6.6 Work Stress and Entrepreneurs 246

6.7 Individual Differences in Personality 247

6.8 Implications of the Present Research. 249

6.9 Summary and Conclusions 253

References. 255

Appendices

Appendix I: Factor Analyses of Questionnaire Measures A1-2

Appendix II: Study 1 Questionnaire. A2-2

Karasek Work Questionnaire. A2-5
Job Satisfaction & House Support Scale A2-6
Eysenck EPQ Questionnaire A2-7
Argyle & Robinson Achievement Motivation Questionnaire A2-8
Paulhus Spheres of Control Questionnaire A2-9
Interpersonal Support Evaluation List. A2-11
General Health Questionnaire A2-13
Life Events Checklist. A2-14

Appendix III: Study 2 Questionnaire

Work Preferences Questionnaire A3-5
Karasek Work Questionnaire. A3-6
House Social Support Questionnaire. A3-7
Eysenck EPQ Questionnaire A3-8
Paulhus Spheres of Control Questionnaire A3-9
General Health Questionnaire A3-11

List of Figures

1-1 Karasek's Demand-Control Model 14

1-2 Theoretical Shapes of the Relationships Between P-E fit on Dimensions and Strains 18

1-3 The House Model. 21

2-1 Schematic Representation of Main and Buffering Effects of Social Support 79

2-2-1 Main Effect Model of Social Support 81

2-2-2 Buffering Effect Model of Social Support. 81

2-2-3 "Pure" Buffering Effect Model of Social Support. 81

3-1 Very Simple Structure Goodness-of-Fit in Relation to the Number of Factors Extracted for the EPQ Measure 105

3-2 Very Simple Structure Goodness-of-Fit in Relation to the Number of Factors Extracted for the Work Preferences Questionnaire 110

4-1 Classification Plot from Discriminant Analysis Showing General "Territory" for each Occupational Group 136

4-2 The Relation Between Social Support and Interpersonal Locus of Control for High and Low Extraversion. 141

4-3 The Relation Between Social Support and Need Achievement for High and Low Extraversion. 143

4-4 The Relation Between Social Support and Need Achievement for High and Low Locus of Control 143

4-5 The Effects of Job Discretion on GHQ for High and Low Levels of Social Support (ISEL) 147

4-6 Normal Probability Plot of Standardized Residuals From Regression of GHQ 151

4-7 The Effects of Job Demand on GHQ for High and Low Levels of Friends Social Support 153

4-8 The Relation Between Job Demand and Job Satisfaction for High and Low Coworker Social Support. 156

4-9 Hypothesized Path Model of the Relationships Between Perceived Demands, Work Factors, Individual Differences, and Health Related Outcomes 159

4-10 Path Analysis Showing the Effects of Antecedent Variables on Job Satisfaction and GHQ 161

5-1 Normal Probability Plot of Standardized Residuals From Cross-Sectional Regression Analysis of Time 1 GHQ 192

5-2 Graph Showing Relationships Between Time 1 GHQ at High Job Discretion for High and Low Partner/Spouse Support 193

5-3 Graph Showing Relationships Between Time 1 GHQ at Low Job Discretion for High and Low Partner/Spouse Support 193

5-4 Normal Probability Plot of Standardized Residuals From Cross-Sectional Regression Analysis of Time 2 GHQ 197

5-5 Graph Showing Relationships Between Time 2 GHQ and Job Discretion for High and Low Supervisor Support 198

5-6 Graph Showing Relationships Between Time 2 GHQ at High Job Discretion for High and Low Supervisor Support 199

5-7 Graph Showing Relationships Between Time 2 GHQ at Low Job Discretion for High and Low Supervisor Support 199

5-8 Normal Probability Plot of Standardized Residuals From Longitudinal Regression Analysis of Time 2 GHQ. 207

5-9 The Effects of Job Demand on Time 2 GHQ for High and Low Supervisor Support 208

5-10 The Effects of Job Discretion on Time 2 GHQ for High and Low Supervisor Support 208

5-11 The Effects of Job Demand on Time 2 GHQ for High and Low Job Discretion 209

5-12 Graph of Time 1 GHQ Against Job Discretion for High and Low Personal Efficacy Locus of Control. 214

5-13 Graph of Time 2 GHQ Against Work-Related Support for High and Low Factor 2 ("Work Routine") Scores 219

5-14 Graph of Time 2 GHQ Against Job Demand for High and Low Factor 1 ("Esteem-Social") Scores 219

Abstract

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Stress, Individual Differences, and Social Support

This thesis is concerned with the role of individual differences in personality and social support in mitigating work-related stress. The model of work stress described by House (1981) served as a general theoretical framework for two questionnaire studies of white-collar workers carried out in the course of this research. The present work also draws upon the demand-discretion model developed by Karasek (1979).

The first study was carried out with a sample (N=117) of employees and self-employed business men and women. The main aims were to investigate: (i) individual differences in perceived social support; (ii) the stress-buffering role of support resources in moderating work-related stress. The results showed significant differences in personality and work characteristics between the occupational groups. There was evidence of interactive relationships between nAch, extraversion and locus of control in predicting perceived social support. Work and non-work support showed different moderating effects on job stressors in relation to job satisfaction and GHQ. A negative buffering effect of social support on job demand was also found in the prediction of GHQ. The findings suggest the importance of investigating further the role of individual differences in the way people develop and access socially supportive networks.

The main objectives of the second study were: (i) to extend, in longitudinal data, previous findings concerning the buffering role of social support and individual differences in mediating the stress-illness relationship; (ii) to test the Johnson demand-control-support model of work stress. Work-related demands, social support, personality traits, and psychological health were assessed among a group of new graduates (N=121) in their first year of employment. The results showed significant changes in the overall levels of perceived demand, work-related support and psychological well-being between Time 1 and Time 2, and replicated the stress-buffering effects of social support found in the first study. More importantly, the findings suggest that the efficacious moderating effects of supportive relationships is dependent on the timing and matching of "stressors" with specific support resources; work-related social support showed weaker stress-buffering effects at initial assessment but was significantly stronger in moderating job stressors at Time 2. Analyses of individual difference variables showed that neuroticism, locus of control, and individual preferences for particular types of work characteristics acted as moderator variables. Consistent with Karasek and Johnson's models, significant demand-discretion and demand-discretion-support interactions was also found. However, in some instances, the three-way demand-control-support interactions were not of the form predicted.

Overall, the present studies provide further information concerning the stress-buffering role of social support and individual differences at work. Further research should also focus on the sequencing of the stress-support process in order to provide a clearer understanding of how supportive relationships moderate work-related demands.

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Chapter One

Concepts and Methods in the Study of Stress

Summary

This chapter reviews general concepts of stress and evaluates response-based, stimulus-based and transactional approaches that have guided stress research. Problems in the definition and usage of the term "stress" are discussed. The role of individual differences in mediating the relationships between stress and illness is emphasized. In this thesis, "stress" is considered to refer to a general area for study rather than a specific concept. Four theories of work stress are presented: (i) role-stress theory; (ii) demand-control theory; (iii) P-E fit theory; (iv) the House model. Conceptual issues and empirical evidence relating to the four models are discussed. The model described by House is adopted as the general theoretical framework for the present research since it shares conceptual similarities with role-stress theory, P-E fit theory and demand-control theory, and because of its generality of approach. Methodological issues in the design of stress research and the measurement of relevant constructs are evaluated. The problems associated with the use of objective and subjective measures of work environment, stress responses and stress-related health outcomes are discussed.

Chapter 1

1.1 Introduction - The Concept of Stress

The scientific use of the word stress is usually attributed to Robert Boyle's investigations of the properties of gases and Hooke's studies of the elasticity of springs in the late 17th century. In physics, the term stress denotes the internal forces generated within a body by the action of any force which tends to distort the body. Closely associated with this idea of stress were words like load, strain, and tension, each term defining specific aspects of the interacting forces and the outcomes that occurred. These ideas and vocabulary were borrowed by the biological and social sciences and conceived as a basis for the study of human adaptation, breakdown, and disease (Hinkle, 1973).

There are numerous although not always consistent definitions of the term stress, perhaps as a result of the varied and diverse disciplines from which the concept originated. The literature generally distinguishes three types of approaches depicting physiological, psychological, and social perspectives. Thus, systemic or physiological stress is primarily concerned with the disturbance of bodily functions and tissue systems (Cannon, 1929; Selye, 1956; 1974), psychological stress with cognitive factors leading to the evaluation of threat (Lazarus, 1966; Lazarus and Folkman, 1984; McGrath, 1970; McLean, 1979), and social stress with the disruption of a social unit or system (Levine and Scotch, 1970; Smelser, 1963).

1.2 Problems of Conceptual Definition and Usage

Many writers have commented on the controversy concerning the definition of stress and the confusion it has engendered in the literature (Fletcher and Payne, 1980; Fleming, Baum and Singer, 1984; Hinkle, 1973; Sharit and Salvendy, 1982). Unfortunately, researchers themselves have used the word stress in several different ways without indicating its specific meaning and are therefore, largely responsible for the lack of clarity as to what stress means. For example, stress has been used to denote pressure on the

individual (stimulus-type definitions), the reactions of the person (response-type definitions), as an alteration in the homeostatic processes of the organism. In addition to the contradictory definitions of stress there is also a lack of consistency concerning the use of terminology. "Anxiety", "conflict", "frustration", "defense" are all used to refer to the same thing - "stress".

In order to avoid adding further to the confusion and ambiguity that currently pervades the literature some writers (Lazarus and Folkman, 1984; MacLean, 1974) have suggested that stress be treated as an organizing concept to define an area of study rather than a specifically defined concept. They proposed that the term stress should be used to refer to a wide range of phenomena that includes the conditions or events that produce psychological or physical reactions in the person as well as all the intervening processes that occur in between the stress stimulus and the stress response. It is this view of stress that is adopted in this thesis.

The term *stressor* will be used to refer to any stressful event or condition arising from the environment, or from within the individual, that produces a psychological or physical reaction that is usually unpleasant, and which sometimes produces symptoms of emotional or physiological disability.

The *stress reaction, or stress response,* refers to the consequences of the stimulus that arises from the stressor. It is the response to a stressor and generally produces physical, cognitive or emotional discomfort in the person. Stress reactions may be mild or severe, depending on the nature and severity of the stressor and other intervening processes e.g. individual differences in susceptibility to stress.

1.2.1 Stress as a Stimulus

Within psychology, the most common and traditional definition of stress is that it is a stimulus. This approach is espoused succinctly by Sir Charles Symonds (1947) in discussions of the psychological disorders of RAF flying personnel. He wrote, "*it should be understood once and for all that (flying) stress is that which happens to the man, not that which happens in him, it is a set of causes, not a set of symptoms.*" Caplan et al (1975) provide a more focused definition and defines (occupational) stress as "*any characteristics of the **job environment** which pose a threat to the individual,*" and which may take the form of "*either **demands** which he may not be able to meet or insufficient **supplies** to meet his needs*" (emphasis added, p. 3). The word stress is used to refer to environmental, situational, or psychosocial factors which are recognized as disturbing, noxious, threatening, and potentially harmful in some way, i.e., *aversive stimuli* which elicit emotional or visceral responses, or which appear to be related to the onset of medical illnesses in which psychosomatic factors are involved. Conditions arising from within the individual, e.g. hunger, pain, are also covered under this definition.

Welford (1973) presented a particular version of a stimulus-based approach to stress in which he viewed stress in terms of "demand" e.g. amount of information processing required, noxious environmental stimuli, acting upon the person. He proposed that most organisms function best under conditions of moderate demand, an optimum level or equilibrium point similar to the physiological principle of homeostasis. When the level of demand is too high or too low, performance is affected.

Lazarus and Cohen (1977) identified three general classes of stressors: (a) cataclysmic phenomena, which refers to sudden, unique, powerful single events or clusters of related occurrences affecting large numbers of people, e.g. natural disasters, war, relocation, (b) major changes that challenge adaptive abilities in the same way as cataclysmic events but affecting fewer persons e.g. death of a loved one, loss of a job,

illness, and, (c) daily hassles, which refer to chronic, stable, and repetitive problems e.g. job dissatisfaction, commuting, having arguments with spouse/partner, interpersonal conflicts at work. Thus, these three types of *stressors* share similarities with the meaning of *aversive stimuli* as used under stimulus-based definitions.

In contrast, Kiretz and Moos (1974) view sources of stress in terms of the adaptation capabilities of the individual. Their approach considers stressors in terms of the magnitude and kind of adjustment required, perceptions of control and valence. Kind of adjustment refers to the *"kinds of coping processes, emotions or illnesses stressors generate"*. For example, some stressors such as severe weather are not directly influenced by the actions of the individual in his attempts to reduce the effect of these stressors. Responses to these types of stressors are more likely to lead to accommodative responses, for instance, staying indoors, or in the case of more severe threats to health arising from say, nuclear pollution of the environment, leaving the area. Perceptions of control refer to the degree to which a stressor is seen as being under the control of the individual. Some stressors e.g. cataclysmic events or serious illness are neither predictable nor modifiable by individual actions. When control is not perceived as feasible or when a stressor is unpredictable greater costs in terms of personal functioning and health outcomes will result. Finally, valence refers to the positive or negative outcomes associated with stressors. For example, while most stressors result in *loss* experiences, some stressors (e.g. beginning a new job) although requiring adaptive responses, produce positive *gain* experiences.

The various types of stressors described by these classifications, however, do not always work because some stressors cut across a different number of distinctions. For instance, the threatening effects of the Three Mile Island Harrisburg incident may be defined as a single, powerful, cataclysmic event but it is certainly not acute, the problems of nuclear pollution and danger to health persisting for years afterwards. More importantly, it differs from natural disasters such as hurricanes and earthquakes in that it has not reached

a clear point of *most significant impact.* It is therefore important to distinguish between the "external" stressors described by Lazarus and the psychological stressors emphasized by Kiretz and Moos.

To summarize, the concept of stress defined as a stimulus is essentially based on an engineering approach. It considers certain situations as normatively stressful in which the events and conditions impinging upon, or occurring within, the individual have to be dealt with. Stress is therefore the load, strain acting on the organism and is generally the independent variable for study.

1.2.2 Stress as a Response

In contrast, stress has been defined in response terms, as in the work of Hans Selye and Harold Wolff. In Selye's view, (1956) stress is *"the nonspecific response of the body to any demand made upon it"*. He described a three stage stress reaction, the General Adaptation Syndrome, which occurs when stress is severe and prolonged: alarm, resistance and exhaustion. According to General Adaptation Theory, "diseases of adaptation" are likely to develop when the organism is continually exposed to aversive stimuli.

The concept of the non-specificity of responses to aversive stimuli is further elaborated upon in a psychosocial theory of stress developed by Kagan and Levi (1971). This complex cybernetic model states that external influences (psychosocial stimuli) interact with genetic factors and with the influences of earlier environments to produce a physiological *response* which prepares the individual for the physical activity of coping. This response, if prolonged and intense, results in impaired functioning and physical disorders.

Response models, popular in medicine and biology, tend to be concerned with the specifications of the particular response(s) which may be taken as evidence that the organism is under pressure from what may be a combination of environmental and

situational factors. Under this approach, stress is a "state" within the organism and clearly not a "force" in the physical sense. The defining stress parameter is the physiological or psychological state of the individual in a particular situation or condition.

1.2.3 Theoretical Issues: Stimulus and Response Definitions of Stress

Stimulus and response definitions have provided useful insights into how stress reactions occur but the adequacy of these two approaches has been questioned on both theoretical and empirical grounds. While the stressful nature of cataclysmic phenomena and other types of disastrous events are immediately obvious, current interest in the scientific study of stress is mostly concerned with less dramatic experiences. In fact, it is the chronic stresses in everyday life that present a special problem for stimulus-based approaches to the study of stress. The problem is in identifying, with some degree of confidence, what it is that is particularly stressful about normal everyday situations in which people encounter most of their stressful experiences. For instance, within the context of work, how does one decide that the job characteristics associated with, say, nursing are more (or less) stressful than those of a teacher or a coal miner? What conditions can be accepted as stressful, and, what are their common characteristics?

While it would appear that part of the answer to these questions depend on how one evaluates the stressful characteristics of the three jobs, it is not often clear what precisely is measured (in terms of the stressful nature of the work concerned) and how criteria for comparisons can be defined. Furthermore, there is the question of individual differences. A situation identified as stressful because of its stimulus characteristics may elicit the appropriate responses from most but not all people. Stimulus-based definitions, however, make no provision for variations in people's reactions to aversive stimuli although statements about stressful environments must, by virtue of the way stress is defined under this approach, rely on data collected from a group of individuals.

However, response-based approaches are also problematic. A major criticism of response-based definitions, and in particular, Selye's "nonspecificity" principle, derives from the fact that the same response patterns e.g. increased heart-rate or blood pressure, may arise from different stimulus conditions e.g. heavy exercise, extreme fright, fasting, and fatigue (McGrath, 1970; Mason, 1971; Frankenhaeuser, 1975). Response per se, therefore, do not necessarily indicate that the person is in a state of stress. However, following response-type definitions, any stimulus which produces the particular response must be viewed as a stressor under this approach. By defining stress as a response there is no way of identifying *a priori* what is and is not a stressor until the reaction has occurred. This implies that the response cannot be reliably judged to be a psychological stress reaction without reference to the stimulus. In order to get round this problem, an adequate conceptualization would need to consider the observed relationship between stimulus and response in defining stress, an issue that is discussed in greater detail shortly.

Furthermore, Frankenhaeuser (1975) demonstrated that emotions and fatigue could, in fact, be both stressors or stress responses, depending on the investigator's choice of dependent and independent variables. In short, there is a problem with the circularity of the meaning of stress when it is defined in isolation, either as a stimulus or a response, since both these approaches cannot clearly specify the criteria which identify and characterize the conditions under which stress occurs.

The idea of stress conceptualized in terms of stimulus or response patterns present a somewhat narrow view of the human system's reactions to pressures or demands. By ignoring the mediating role of psychological processes in the stress-adaptation-outcome chain, such models assume the person's passive role in the occurrence of stress. Except perhaps for extremes of environmental demands, individual differences are evident in the range of human reactions to more moderate stimuli. For instance, laboratory and field studies have shown that what may be noxious, threatening stimuli to some people may not

have similar effects on others (see Lazarus and Folkman, 1984 for a review). This suggests that a valid and useful theory of stress would need to include an evaluative component in its formulation in dealing with the problem of individual differences in the perception and response to stress. Transactional approaches, based on cognitive appraisal processes and emphasizing the relationship between the individual and the environment, provide this important intervening link and are discussed shortly. At this point, it would be helpful to define the meaning of stress and stress-related concepts used in the present thesis.

1.2.4 Stress as a Relation Between the Person and the Environment

To meet the definitional problems encountered in the two previous models, some writers have proposed that stress can be more adequately described in terms of a relation or transaction between the person and the environment. Transactional or relational models view perceptual and cognitive processes as the primary mediators which determine why and to what extent a particular transaction (or series of transactions) between the person and the environment is stressful (Cox and Mackay, 1981; Kagan and Levi, 1974; Lazarus, 1966; McGrath, 1970)

In McGrath's (1970) view, stress is *"the **anticipation** of inability to respond adequately (or at a reasonable cost) to perceived demand, accompanied by anticipation of negative consequences for inadequate response"* (p. 23). Following this, he suggests that stress occurs when there is an *imbalance* between environmental demands and the response capability of the individual. McGrath's emphasis on how demands are interpreted and evaluated is mirrored in Lazarus' psychological definition in which he defines stress as *"a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being."* (Lazarus and Folkman, 1984; p. 19). In the light of Lazarus' conceptualization, clearly the imbalance which McGrath referred to is that between the individual's *perceived* demand

and *perceived* capability rather than the actual or *objective* levels of these variables. The extent to which an event will be seen as threatening (or benign) is therefore dependent upon a constellation of personal and contextual features since these are causally linked to the individual's perceptual process.

An extensive series of studies have demonstrated that stress response(s) are indeed mediated by cognitive appraisal processes and identified some of the personality characteristics and situation factors on which mediation depended (Affleck et al, 1987; Folkman et al, 1986; Krantz, 1983; Kuiper, Olinger, & Lyons, 1986; see Lazarus & Folkman, 1984, for a summary of the literature). The transactional view of stress presents a more adequate and flexible approach to stress research in that it takes into account the role of individual differences and cognitive evaluation as intervening processes in the occurrence of stress. This transactional approach, discussed in greater detail later, serves as the theoretical basis for the studies carried out in this thesis.

1.3 Approaches to the Study of Occupational Stress

While response, stimulus and relational definitions of stress emphasize particular themes, the general picture that emerges is that people respond to (internal or external) demands made upon them. When the demand exceed the person's capability to respond, physical or psychological functioning is affected. This relationship is of course mediated by psychological processes. Perhaps the most obvious area in which ideas from these theories of stress could be usefully applied is in studying the consequences of stressful encounters arising from problems in everyday life, where sources of stress range from natural and man-made adversities like earthquakes and wars, to the daily annoyances of commuting to work in heavy traffic.

In addition to studies which examined the effect of stress on functioning in wartime situations (e.g. Bourne, 1969; Dearnaley and Warr, 1979; Grinker and Spiegel, 1945), disasters (e.g. Lucas, 1969, Anderson, 1977), life events-crisis (e.g. Thoits, 1983; Holahan & Moos, 1985), and chronic stress (Burks & Martin, 1985; Felton & Revenson, 1984), stress theory and research have been applied to what is now an increasingly important area of concern in modern society - the work environment. Several models of work stress have been formulated, based on concepts drawn from response, stimulus and transactional approaches. Four of the more current and influential approaches to the study of work stress are: role-stress theory, demand-control theory, person-environment fit theory, and the House model.

1.3.1 Role Stress Theory

Role stress theory, one of the earlier models of work stress (Kahn, Wolfe, Quinn, Snoek, and Rosenthal, 1964) focuses on the person's role at work as a major source of occupational stress. Role pressures or demands are seen as coming from organizational and environmental factors. The model specifies three role related domains which may

adversely affect job satisfaction and health; role ambiguity (lack of clarity about individual roles and behaviour), role conflict (incompatible or conflicting job demands concerning the role the individual should be performing), and, role overload (excessive demands or pressures). Evidence for relationships between these three types of demands and mental and physical health outcomes have been reported from a number of studies of white collar workers, including managers, scientists, engineers and administrators.

In the original study, Kahn and his colleagues (1964) investigated the dynamics and extent of role ambiguity and conflict in the role requirements experienced by a sample of 53 U.S. white collar supervisory and management personnel, designated as "focal persons". Data was also collected from other employees (n=381) identified as members of the focal persons' role sets. In order to evaluate the prevalence of role stress and also replicate the findings of this intensive study on a representative population, a national survey and interview of 1500 people was carried out. The results showed that 35 per cent of the respondents were unclear about the scope and responsibilities of their job. A similar proportion expressed feelings of uncertainty and lack of clarity concerning what was expected of them by their coworkers. Role ambiguity was negatively correlated with job satisfaction and self-confidence; men who suffered from role conflict also experienced higher job-related tension and a greater sense of futility.

This pattern of findings have been replicated in other studies of role stress (Caplan 1971; Breaugh, 1980; Singh et al, 1981; Margolis, Kroes, and Quinn, 1974). For instance, in a study using several physiological measures Shirom et al (1973) found that role conflict was significantly related to coronary heart disease (specifically, abnormal electrocardiographic readings), but for white collar workers only. Studies that have concentrated on role overload have found quantitative overload (having too much to do) to be associated with low self-esteem among administrators, and qualitative overload (having

work that is too difficult or complex) with low self-esteem among professors (Caplan, 1971).

Role stress models reflect a predominantly social-psychological perspective in their approach. Its conceptual framework is linked with many elements of organizational structure, for instance, individual, group and organizational goal setting, organizational boundaries which delimit role sets, and, occupational level or position. There are two difficulties with role theory as a general approach to studying work stress. First, it ignores the actual job or task characteristics in the work environment which may be potentially important sources of stress. Second, the theoretical concepts imply that individual and organizational roles are subject to perceptual processes. As a result, the measures used to assess role ambiguity, conflict, and overload are primarily subjective measures. Few techniques or quantitative scales have been developed which enable independent objective assessments of the three concepts.

1.3.2 Demand-Control Theory

Demand-control theory (Karasek, 1979) emphasizes environmental demands and constraints, in particular, the structural characteristics of work, as the primary source of stress. It specifies three central ideas: (1) job demands - which includes all stressors affecting work although task demands are seen as the primary stressor (2) job decision latitude - which includes control over use of skills, time allocation, organizational decisions and, (3) job strain - a derived composite measure reflecting the joint effects of job demands and work control.

The model, shown in Figure 1.1, postulates that mental strain arises when (adverse) job demands are combined with (low) job decision latitude. It predicts that jobs with high work demands and low job decision latitude will result in strain.

Chapter 1

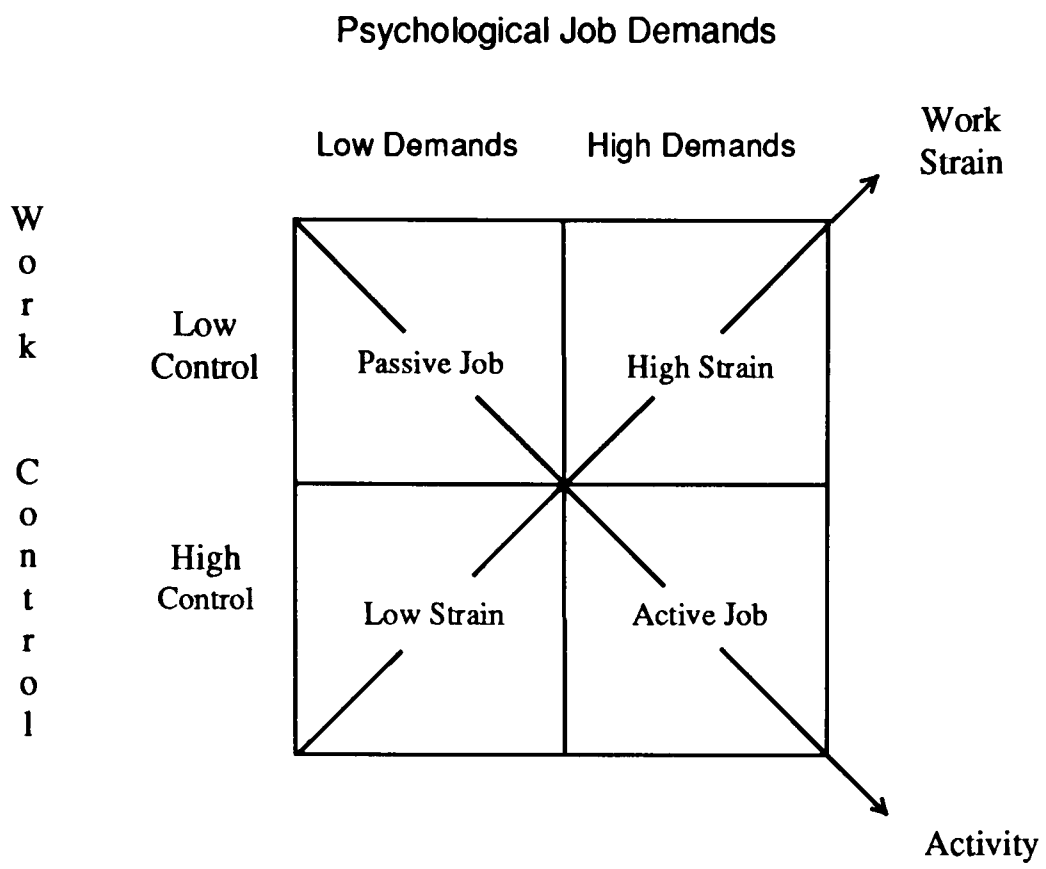

Figure 1.1 Karasek's Demand-Control Model

The model also distinguishes between active and passive jobs. Active jobs are those jobs with high demands and high decision latitude. Passive jobs are those entailing few demands and low decision latitude, and are not hypothesized to be a source of risk in terms of health status.

Karasek argued that the contradictory findings and inconsistencies in the work stress literature are mainly due to two related errors in the analysis and interpretation of data. First, many studies have failed to distinguish between job demand and job decision latitude (defined in the previous paragraph), and have tended to combine the two factors into a single index of stress (e.g. Quinn et al, 1971; Blood and Hulin, 1967; Hulin, 1971). Misinterpretation of the true sources of job strain could also occur when researchers overlook the joint interactive influence of demand and control and concentrate only on the

main effects of either characteristic. The utility of the model therefore hinges on the conceptual distinction between demand and control.

The predictions of the demand-control model have been substantiated by several large scale studies in the United States - the U.S. Quality of Employment surveys of 1969, 1972, 1979, and in Sweden - the Swedish Survey of Level of Living in 1968, 1974 (Alfredsson, Karasek and Theorell, 1982; Karasek 1979, 1981; Karasek et al, 1981, 1988). Perhaps the most important of these studies was a six-year prospective investigation of the relationship between cardiovascular-cerebrovascular mortality and specific job stressors among a national sample of the Swedish adult population (Karasek et al, 1981). The major focus of these studies has been on the main and interactive effects of job demands and job decision latitude on strain. More recently, using data drawn from a large random sample of Swedish union members, Karasek, Gardell and Lindell (1987) reported that job control was the one variable that was most highly negatively correlated with health outcome variables although it was not clear from the study whether tests for interaction effects between job demand and job control were carried out. A longitudinal study by Bromet and her colleagues (1988) provide more convincing support for the Karasek model since their data were collected in face to face interviews and the analyses controlled for previous health history and other work and personal factors. They found significant demand-control interactions in predicting alcohol problems and symptom levels among a sample of 325 male workers.

However, other studies have reported little or no evidence of demand-control interactions (Beehr and Drexler, 1986; Hesketh and Shouksmith, 1986; Spector, 1987a; Payne and Fletcher, 1983). The findings reported by these studies revealed significant main effects for demand and control but not for the predicted interaction effects. Thus, except for the Bromet et al study, most of the evidence for demand-control theory have come mainly from Karasek and his colleagues. One possible reason for the discrepancies

in these findings is that different studies may have used a variety of different measures of demand and control. Another possible reason may be that differences between subjects, in particular, general population samples and homogeneous occupational groups, may underlie the differences in the results obtained.

On a theoretical basis, it appears that demand-control theory is better able to clarify the work conditions that are associated with strain. Its power in predicting adverse health outcomes has been reported to be good (Sharit and Salvendy, 1982). In comparing it with P-E fit, Baker (1985) concluded that the strength of the Karasek model lies in the concept of control (as distinguished from demand) measured as a discrete variable. The distinction between demand and control allows analysis of the separate and joint (interactive) effects of each of these determinants of strain to be assessed. This enables the model to explain additional variance in the prediction of strain as P-E fit does not assess control as an independent variable. Another appealing feature is the relative simplicity and parsimony of the model.

A limitation of the demand-control model is that it does not consider social factors within the work environment, in particular, social support, that may be important in moderating the effects of work stress. The function of social interactions at work and its role in fulfilling people's needs for affiliation and sense of well-being are well documented (Jahoda, 1981; Frese, 1982). More recently, Johnson and Hall (1988) have suggested that the Karasek model should be extended to include social support as a third orthogonal dimension of the work environment thereby providing a broader conceptualization with possibly greater predictive value. In a cross-sectional study which partially supported their predictions, Johnson and Hall found high cardiovascular disease prevalence rates among workers who reported high demand, low discretion and low social support. The question therefore arises as to whether the extended demand-discretion-support model also applies to other health-related outcome measures including mental health.

1.3.3 Person-Environment Fit Theory

Over the last two decades, a number of researchers at the Institute of Social Research, University of Michigan, have developed an approach to stress research that emphasizes a match between the person and the environment (Campbell, 1974; Caplan, 1971; French & Kahn, 1962, French et al, 1974; van Harrison, 1976; House, 1972; Pinneau, 1976). P-E fit theory, as formulated by French and his colleagues (1974), represents one attempt to translate transactional approaches into a theory of work stress in which psychological processes are seen as the mediating link between the demands of the environment and the responses of the person.

The theory suggests two types of fit between the individual and the environment. The first type of fit is the extent to which the person's skills and abilities match the demands and requirements of the job. The second type is concerned with the extent to which the job environment provides resources to meet the needs or motives of the individual. The concept of imbalance between demand and response capability (Caplan et al, 1975) and the role of psychological processes in the interpretation of demands (McGrath, 1970), central themes under stimulus-based and transactional approaches to the study of stress, underlies both types of fit suggested by P-E fit theory.

In order to determine the degree of objective and subjective fit along all the major work dimensions, quantitative assessment of person and environment variables are needed both in terms of objective measures, and as subjectively perceived by the individual concerned. The utility of P-E fit theory is based on the assumption that people vary in their needs and abilities, analogous to the idea of individual differences in the response to the same (aversive) stimuli. It predicts that when poor fit of either kind occurs, strain results and the individual's well-being is impaired. Motives include factors such as income, participation and self-utilization. Demands include work load and job complexity. The model also distinguishes the *objective* environment and person from the *subjective*

environment and person. This mismatch is described in terms of hypothesized "motive-supply", "abilities-demand" relationships between P-E dimensions and strains. Figure 1.2 shows a simplified form of the hypothesized relationship between P-E fit and psychological strain.

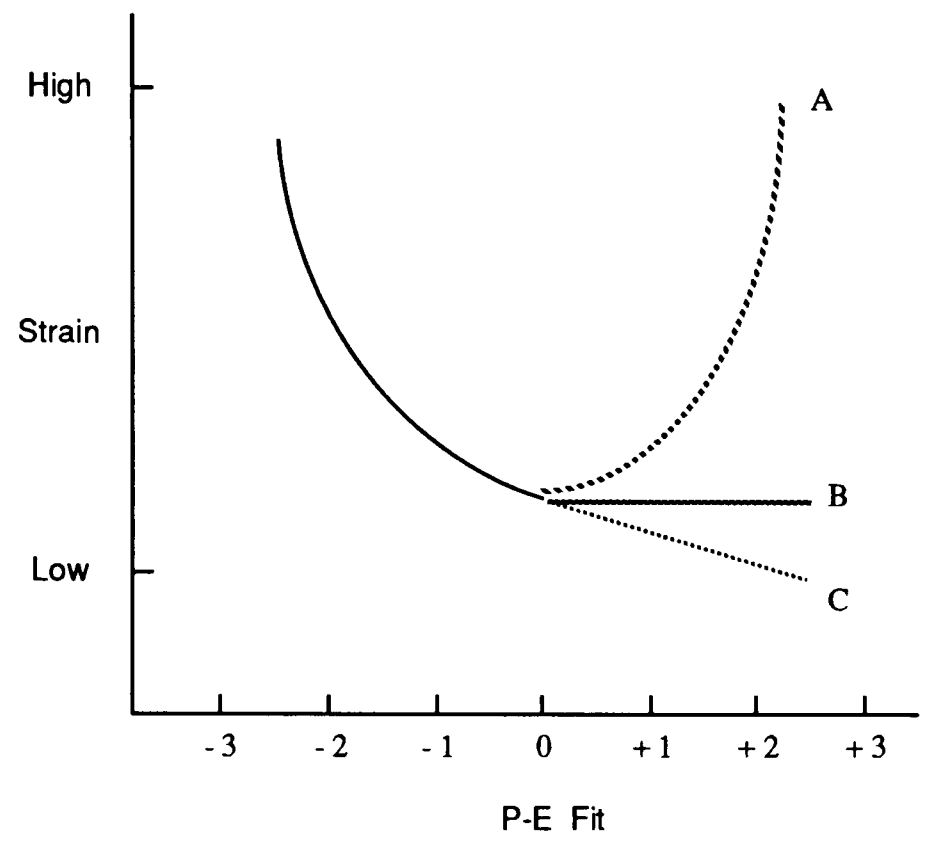

Figure 1.2 Three Hypothetical Shapes of the Relationship Between P-E Fit On (Motive-Supply and Demand-Ability) Dimensions and Strains.

The horizontal axis represents discrepancies between the person and the environment on commensurate dimensions of motive-supply or demand-ability. Perfect fit is represented by the zero score. The solid line shows the monotonic decrease in strain as the discrepancy between P-E fit decreases, reaching an asymptote at perfect fit, where P-E = 0. This monotonic relationship applies to both types of fit, for instance, where supplies are not sufficient to meet motive levels, or where demands exceed abilities. At this point, excess supplies (over motive) or excess ability (over demand) may result in: (i) no change in the level of strain [line B]; (ii) decreased strain [line C]; or (iii) increased strain [line A];

depending on whether excessive supplies for one motive are interchangeable for supplies of other motives.

Evidence for P-E fit theory comes mainly from a large cross-sectional study of job demands and worker health (Caplan, Cobb, French, van Harrison, and Pinneau 1975; French, Caplan, van Harrison, 1982). Using a sample of 2010 workers in 23 occupations, Caplan and his colleagues assessed P-E fit on eight dimensions: work load, job complexity, role ambiguity, responsibility for persons, income, overtime, length of service and education needed to do the job. P-E fit was measured by asking respondents to rate the extent to which a specific work characteristic was present on the job, and the amount of that characteristic they preferred. For example, *"How much work load do your have?"* and *"How much work load would you like to have?"*. Perfect P-E fit occurs when responses are exactly the same to the paired questions. Misfit is defined as the numerical difference between the scaled responses to the paired questions.

Clear differences were found in the degree of P-E fit across the 23 occupations. White collar occupations, in particular, family physicians, administrative professors, and train dispatchers reported the highest level of quantitative work load. Demand for concentration was also high in these jobs but was low for machine-paced assembly line workers. Overall, the most important stressors appeared to be excessive work load, job complexity misfit, underutilization of skills, and unwanted overtime. Caplan and his colleagues concluded that *"assemblers and relief workers on the machine-paced assembly lines have the highest stress and strain of any of the 23 occupations"* (p. 201).

P-E fit theory reflects the transactional approach to stress in that the strain which occurs is a result of the imbalance, or misfit, between the person and the environment. The primary emphasis of this approach is centered on the individual's needs, values and abilities. P-E fit, however, does not elucidate particular workplace conditions that cause stress since it ignores the role of environmental constraints in its formulation. This suggests

that P-E fit is not particularly appropriate to the study of work environment factors. Furthermore, Baker (1985) and Kasl (1981) have commented that the link between the "objective" aspects of the work setting and the "subjective" perceptions of the individual is indeed a very tenuous one. This means that a major difficulty with P-E fit theory is in deriving quantitative measures for operationalizing the "objective-subjective" "person-environment" constructs. As a result, there is as yet no published empirical data on all aspects of the model although some features of the hypothesized links relating to objective-subjective and person-environment concepts have been applied in empirical studies. Caplan et al (1975), and French, Caplan and Harrison (1982) have reported evidence supporting certain aspects of P-E fit theory. More recently, Caplan, Tripathi and Naidu (1985) have noted that research on P-E fit needs to measure and test the effects of P and E on strain and health outcomes separately if the theory is to contribute to knowledge about the psychology of stress.

1.3.4 The House Model

Much of the research into occupational stress have been based on the assumption that it is the employee's subjective perceptions of the work environment, rather than its objective characteristics, that is important in determining worker satisfaction and well-being. In a sense, this perceived work environment model is also one of the key ideas in transactional approaches to stress. A paradigm of stress research integrating these two approaches has been presented by House (1974, 1981), shown in Figure 1.3.

A useful starting point in evaluating the House model is to consider the factors that give rise to the "stress situation".

This can be described in terms of a three-stage closed loop comprising boxes 1 (work environment), 2 (perceived stress), and 3 (short-term responses to stress) in the model (Figure 1.3). Thus, "stress" usually begins with some given situation or set of

Chapter 1

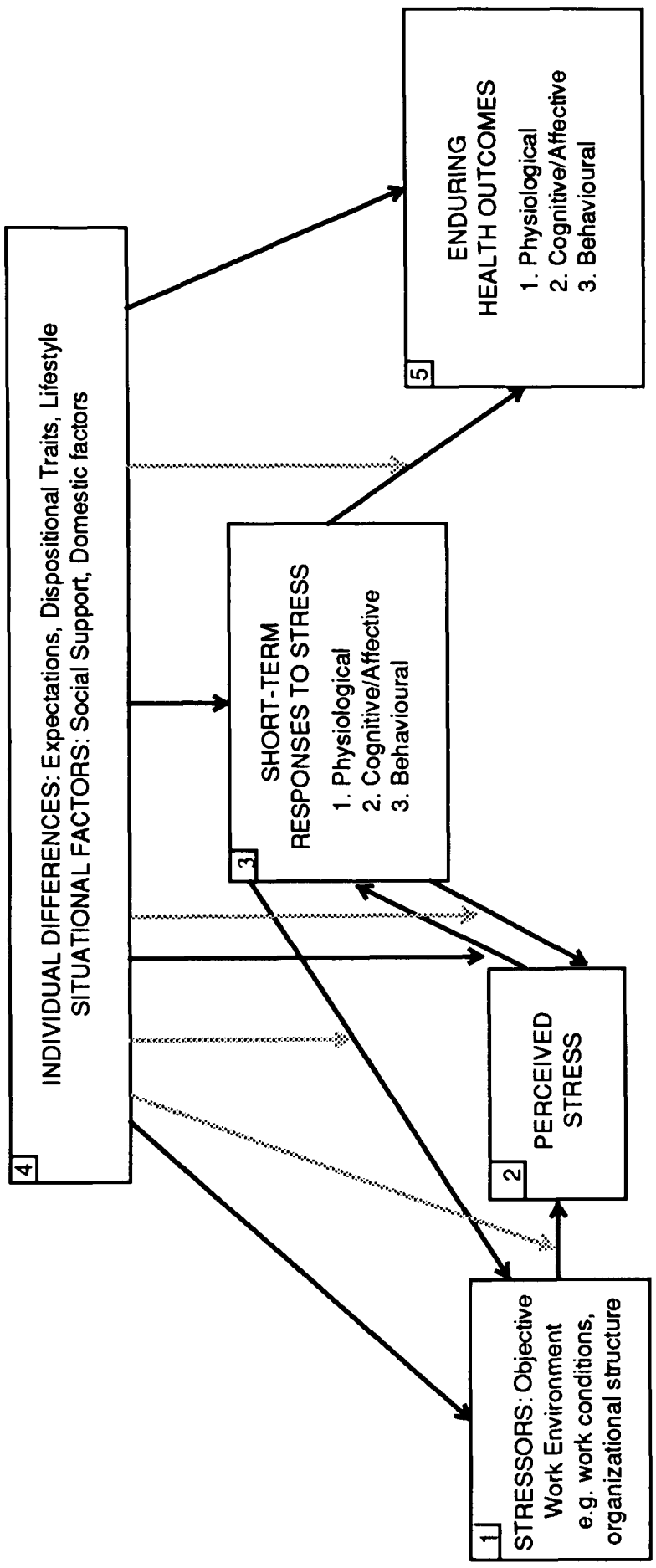

Fig. 1.3 A Paradigm of Stress Research (Adapted from House, 1981)

Note: Solid arrows between boxes indicate presumed causal relationships among variables. Dotted arrows from the box labelled individual differences and situational factors intersect solid arrows, indicating an interaction between the variables in the box at the beginning of the solid arrow in predicting variables in the box at the head of the solid arrow.

conditions in the work environment (Box 1). They include characteristics of the job, organizational structure and policy, work relationships, as well as physical work conditions. These objective work environment variables are perceived as demands by the employee. Objective environment refers to those aspects of the work environment and situation that are external to the individual and independent of his perceptions.

The individual is continually appraising the demands made upon him by the objective work environment and by his abilities to meet those demands (Box 2). Demands may also be internally generated reflecting personal needs and values e.g. self-esteem, achievement, growth, consistent with "need-satisfaction" theories (Maslow, 1954; Herzberg 1966; Locke, 1976). Furthermore, the environment may not provide the opportunity for the individual to satisfy his needs. Stress is perceived by the individual in response to the objective work environment when the demands on the person exceed his abilities, or when the work environment is unable to fulfill his needs and motives, whether that perception is accurate or not.

The individual reacts (Box 3) to the "stress" arising from the imbalance between demand and resources in attempting to restore the preexisting equilibrium condition(s). The stress reactions may be manifested through physiological, cognitive, or behavioural adaptation strategies with consequent health outcomes (Box 5).

These stages (Box 1, 2 and 3) are connected by the linking processes shown as solid lines. The reciprocal causal link between perceived stress and short-term responses indicates that either of these components may influence the other, for instance, the person may respond to a threatening situation by "direct action" coping which acts to reduce the subjective state of stress.

Another important assumption of the House model is that the effects of job stressors on physical health and mental well-being is very much a function of the interaction between

the person and the situation. More specifically, how an individual perceives a given social or objective condition is presumed to depend on personality and situational factors e.g. trait neuroticism, locus of control, social support, organizational structure. The hypothesized causal links connecting these moderating variables (Box 4) to the three components of the stress process and heath outcomes (Box 5) are shown as solid and shaded arrows.

Personality dispositions and situational factors may have two types of effects on the stress process: (1) potential main (additive) effects represented by the solid arrows (2) potential buffering (or interactive effects) represented by the shaded arrows. Social support may directly reduce the level of objective stressors or perceived stress and promote health (main effect). For example, a friendly, pleasant social environment at work may lessen the risk of objective stressors such as interpersonal conflicts. Social support may also provide protection against stress in less obvious ways; its moderating effect may only be present in combination with high job demands (interaction effect). In the case of personality dispositions, not all people exposed to the same stressors may necessarily experience similar immediate responses or longer-term health outcomes. Personality traits e.g. "hardiness", "Type A" behaviour pattern, flexibility, may predispose susceptibility to the illness-provoking effects of job stressors. In summarizing, the House model draws attention to the cognitive appraisal processes involved in the evaluation of objective task characteristics and work conditions, and the influence of individual and situational factors in mitigating stress and health outcomes.

There is evidence from a number of studies supporting the hypothesized causal relations between perceptions of the work environment (Box 2 in the model) and a variety of affective, somatic, attitudinal and health outcomes (Box 3 in the model). The strongest correlations have been found for affective variables (e.g. job satisfaction) and perceptions of job attributes such as workload, autonomy, and role conflict (Hoiberg, 1978; Jackson and Schuler, 1985; Spector, 1986, 1987a; Ganster, Fusilier and Mayes, 1986).

Chapter 1

James and Tetrick (1986) examined the theoretical rationale that job perceptions mediate relations between work environmental factors and affective reactions to these work factors. Using data drawn from a sample of heterogeneous sample of jobs and work contexts in order to insure adequate variation in job attributes and work group structures, the authors tested three alternative models describing the causal links between job factors (objective work environment), perceptions of the job, and job satisfaction (affective response outcome). Confirmatory analyses of the data showed that the direction of causal relationship is "perception" → "response", that is, affective outcome (job satisfaction) follows cognition (perception). Furthermore, the results indicated evidence for a reciprocal causal relation between job perceptions and job satisfaction. This study provides strong empirical support for the three-stage closed loop stress process of the House model, described in the preceding paragraphs.

In another study, Parkes (1982) demonstrated that changes in the work environment produced corresponding changes in affective and behavioural outcomes. This research provides good support for the causal role of the work environment in influencing health outcomes since the study used both subjective and objective assessments of the work environment and a tightly controlled experimental design in which the same subjects (nurses) were exposed to different work situations over a period of time. Although the research was not specifically designed to test whether "perceptions" (Box 2 of the House model) were causally linked to the work environment (Box 1), responses (Box 3), and health outcomes (Box 5), evidence for the causal relation between work situations and well-being indicate that perceptions mediate between the two.

The influence of individual differences and situational variables (Box 4) on the stress process have been investigated mainly as separate issues, for instance, under the general topic of vulnerability factors, in stress research. Several empirical studies have reported evidence indicating that certain dispositional factors e.g. "hardiness", locus of

control, are related to perceptions of stress, coping and adaptation, and health outcome (Anderson, 1977; Kobasa, Maddi and Kahn, 1984; Parkes, 1986). Social support has also been implicated as a vulnerability factor in research on stress in the workplace. The moderating influence of personality trait factors and social support on stress are reviewed separately in Chapter 2.

The House model represents an approach that is general enough to be applied to a wide range of occupational settings. Its theoretical basis is not dissimilar from P-E fit theory, or even demand-control theory, in that it views stress as arising from an imbalance between the individual and the environment. In contrast with the complexity of obtaining valid and reliable P-E fit measures and the relatively parsimonious demand-control model which does not specify individual and situational factors, this approach defines a more comprehensive specification of variables that are potentially important in understanding work stress, yet allows the researcher to focus on the main and interactive relationships of specific factors e.g. job demand and job control, locus of control beliefs, and social support within a general theoretical framework. It is therefore more wide-ranging in its approach. The theoretical basis for the research carried out in this thesis is drawn from the House model presented by House (1974a, 1981). The specific aims of this thesis are described in Chapter 2 in the light of research issues highlighted by a review of the work stress literature.

To summarize, the four models of work stress discussed above share common themes with the more general response, stimulus and transactional approaches to the study of stress. For example, the mediating role of individual differences in determining stress responses, drawn specifically from transactional approaches, is also conceptualized as an important moderating factor in understanding the illness-provoking effects of stress under P-E fit theory and the House model. The concept of stress defined as a stimulus emphasized the notion of an external load or strain; this corresponds to the focus on environmental constraints as "demand" under the demand-control theory of work stress.

A further link between response, stimulus, and transactional models and work stress theories is reflected in the assumption that the human system functions most effectively at some equilibrium level of demand and (psychosocial) resources. Any departures from this "ideal" set-point results in a disturbance of "homeostasis", and as a result, produces stress reactions. This key concept is also evident in theories of work stress. For example, under role-stress theory, role ambiguity is conceived of as the discrepancy between the amount of information a person has and the amount of information he requires in order to perform his role adequately. This implies that "zero", or no, role ambiguity occurs when the amount of given information corresponds to the information required (optimum level).

The concept of an equilibrium operating level is also found in person-environment fit theory. One of the general assumptions of this model postulates that when there is perfect fit between the person and the environment, that is, when the person's skills and abilities match the demands and requirements of the job, no strain or stress reactions are likely to occur. Similarly, demand-control theory is also formulated on the idea that an imbalance between the individual and the environment results in stress although the form of the imbalance is in the amount of decision-making accorded the worker.

On the other hand, the concept that stress is an interaction between the person and the environment, described in transactional models, is reflected in demand-control theory which is explicitly defined in terms of the joint interaction effects of job demands and job decision latitude. The limitations and merits of the general approaches to studying stress have been noted by investigators in developing specific theories that may contribute to our understanding of how work may affect health.

1.4 Methodology Issues In Research

Research designs form the basis for the measurement of variables and measurements in turn are the basis for the results and inferences that are drawn from research. Weak research designs and inadequate measures constitute a major obstacle that has hampered investigators from establishing more definitive conclusions about the mechanisms linking work stress and health. A host of conceptual and measurement problems have been identified in epidemiological and psychosocial approaches to the study of stress (Kasl, 1978, 1987). These include validity and reliability issues, instrument reactivity, confounding variables, "Hawthorne" effects, and the problem of randomization and matching of subjects for case control, important factors affecting the validity of conclusions that can be drawn from research. Before reviewing the literature, it would be helpful to briefly discuss some of the difficulties that are involved in the design of field studies and in the measurement of stress and stress-related outcomes.

Critical evaluations of research designs and measurement issues in the field of stress and health are to be found from the perspectives of epidemiology (Schlesselman, 1982), educational psychology (Campbell and Stanley, 1966; Cook and Campbell, 1979), and developmental psychology (Baltes, 1968; Nesselroade and Reese, 1973). These sources provide in-depth discussions of most of the issues relating to methodologies in the study of stress. The present studies reported in Chapter 4 and 5 used both cross-sectional and longitudinal designs. The data were collected by means of mailed questionnaires. Consequently, the discussion will focus mainly on methodology problems associated with correlational research design, and with questionnaire methods of data collection.

1.4.1 Cross-Sectional versus Longitudinal Research

Cross-sectional research, the simplest of the correlational research designs, examines the relationship between selected variables and health related outcomes, all the

measurements being taken at one point in time. This approach is useful in determining if two or more variables are related, the correlation coefficient indicating the strength of the association. In studies which investigate several variables, dimension reduction techniques such as factor analysis (Harman, 1976; Gorsuch, 1983) can be used to determine the underlying theoretical factor structure among the variable set.

A major problem with the use of cross-sectional designs is that inferences of causality which can be drawn are limited although certain statistical techniques such as path analysis can provide a weak test of causal relationships. Thus, research that seeks to relate occupational characteristics to mental and physical health, whether based on epidemiological approaches or detailed investigations of particular groups of workers, do not allow causal inferences to be unambiguously identified. In any case, the direction of causation cannot be determined. Furthermore, intervening events or extraneous factors may cause spurious relationships which result in the data revealing an association (or otherwise fail to do so) irrespective of the true nature of the underlying process under investigation.

An example that illustrates this difficulty can be found in the interpretation of data from cross-sectional studies of work stress and social support. For example, there are consistent observations that workers with lower levels of social support or social integration experience poorer mental health than those who are better integrated. However, the observed relationship between social support and lowered psychological well-being may be due to underlying "third factors" that influence both support and well-being, for example, variables associated with social class. (The problem of confounding of variables is discussed in greater detail under the section on measurement issues.) Furthermore, symptomatolgy may also determine (and therefore predict) the amount and quality of social support a person receives, since persistent illness may affect social competencies and patterns of social interaction. Until recently, much of occupational stress research relied

heavily on cross-sectional designs which could only provide evidence suggesting the relationship between work environment stressors and health.

Longitudinal or prospective research designs, a variation of correlational approaches, involves taking two or more measurements of a group of subjects at different time points in a study. It represents a substantial improvement over cross-sectional designs by virtue of its lagging procedure in which it is possible to establish the temporal ordering of hypothesized cause and effect variables. While such designs are invaluable in ruling out many of the problems inherent in cross-sectional studies, their value in determining causal networks is dependent upon a host of other considerations. They include: (1) accurate timing of measures relative to the causal process; (2) use of well-defined independent measures of stressors, strains and health status. A number of techniques are available for the analyses of longitudinal data, the most popular among these in psychological research is cross-lagged correlation. However, the validity of this procedure for making causal inferences has been questioned because it does not appear to provide reliable information about causal effects (Rogosa, 1980) and its value for occupational stress research has not been convincingly demonstrated.

Another problem concerns the type of stressor studied. Kessler (1987), and Frese and Zapf (1988) have pointed out that exposure time of stressors, in particular, chronic stressors, can present significant problems in the longitudinal analysis of causal effects because stresses of this type are slow to change. In considering these possible contaminating factors, timing and accuracy of measurements are therefore crucial in insuring reliable data collection and valid interpretation of results. A detailed discussion of these issues can be found in Frese and Zapf.

At best, cross-sectional and longitudinal studies yield only correlational data. When causal hypotheses are tested using path analysis techniques, significant results can only provide support for the causal model. It does not prove that the model is correct.

1.4.2 Measurement of Variables

Apart from problems that are inherent in research designs, the measurement of stressors, stress response(s), and health related outcomes present a challenging and formidable task. Many reviews of the occupational stress literature have noted that the often conflicting evidence found in studies of stress and health are due partly to different conceptualizations of the stress concept and mainly to inaccurate and unreliable measurement of variables. Adequate measures of the work environment and a range of physical and mental health variables are needed if unambiguous conclusions are to be drawn from the data collected. Some of the more common measurement problems are discussed in the following sections.

(i) Objective versus Subjective Measures: Definition

There are several different ways of defining objective and subjective constructs. Objective can be used to mean material objects and processes only. Correspondingly, all psychological processes are therefore subjective. This approach is usually of little use because it does not allow the conceptualization of psychological stressors e.g. lack of perceived control, mental workload, as objective variables.

The second use of objective is in the sense of being real, being a part of reality. Within the context of this meaning, subjective would mean illusory or unreal. However, perceptions of stressors are seldom illusory in the sphere of work, hence this approach would not allow the differentiation of objective and subjective variables in stress research.

Objective can also be defined as being *independent* of the individual's perception. In this sense, subjective would mean being tied to one's cognitive and emotional processing. This conception is in contrast with the first type of usage as psychological processes can now be called objective as long as they are not part of, or related to, the individual's cognitive and emotional processing. It is this definition that is perhaps the

most useful as it allows us to translate objective and subjective constructs into operational measures.

(ii) Objective and Subjective Measures: Measurement Issues

Stress research has typically conceptualized subjective measures to be self-report indicators (e.g. questionnaires) irrespective of the factual information reported by respondents, and objective measures as data that is not supplied by the same person concerning his feelings of distress, strain and dissatisfaction. Objective measures include independent ratings from "outside" sources as well as factual information about work tasks, job characteristics and company structure. However, this differentiation is not strictly adequate as certain types of information obtained from self-reports e.g. age, number of years work experience, earnings, hours of work, do reflect objective reality. It is therefore not often clear what investigators refer to when they report the use of objective type measures in their research as the meaning is not usually clarified.

On the whole, stress research has been quite successful in establishing correlations between job stressors and a number of response and health outcomes although some writers have expressed concern over the almost exclusive reliance on subjective methods of measurement in the study of work and health. Most of these studies have been formulated on the transactional paradigm which emphasizes the role of subjective evaluation of work environmental factors. The substantive question, therefore, is whether self-report measures are valid indications of (objective) environmental conditions and, what other factors influence such perceptions. Furthermore, are subjective assessments of stressors related to health outcomes?

There are a number of ways in which measurement errors associated with the use of subjective measures may render test results, and consequently correlations between environmental conditions and outcome variables, invalid. These errors in measurement can

be broadly grouped under two categories: (1) errors due to response bias; (2) errors resulting from the conceptual overlapping of items between dependent and independent variables.

Response Bias

Response bias refers to systematic errors that arise as a result of distortions in procedures or characteristics of the instrument or the respondent. Response biases include: (i) social desirability (or "faking" good) - the tendency "to deny socially undesirable traits and to claim socially desirable ones, and the tendency to say things which place the speaker in a favorable light" [Nederhof, 1985, p. 269]; (ii) acquiescence - the tendency to agree (or disagree) irrespective of the content of the question; (iii) negative affectivity - the disposition to experience and report negative emotional states.

In a recent review of social desirability responses in personality measures (EPQ, EPI and MMPI), Furnham (1986) noted that social desirability may be a relatively stable trait similar to social conformity and adjustment rather than a situationally-specific response set. Measures of mental health and related concepts e.g. neuroticism, assertiveness, depression, therefore, tend to be correlated with social desirability since they are conceptually related. Current mood or well-being status may also predispose subjects to respond in a certain way and thus influence the report of stressors or symptoms.

Confounding of Variables

Another limitation of subjective measures is the danger of spurious correlations between stress and health measures, either because of common method variance (discussed later) or because of confounding effects. Confounding occurs when the relationship between two variables are affected by *other* variables which are related to the variable(s) of interest. Various types of confounding may therefore give rise to falsely appearing significant relationships. They range from outright contamination, where there is overlap

between criteria or items (confounds of content) used to assess dependent (outcome) and independent variables (risk factors), to cases where the predictor and outcome variables reflect some latent underlying variable although no apparent redundancy in the measurement of dependent and independent variables (confounds of process) may be apparent.

Confounding involving a third variable is a more pervasive problem. For example, the size of the correlation coefficient between social support and psychological health may be partly due to the underlying effect of trait extraversion or other social competence variable related to the measure of social support. Extraneous "third factor" variables that influence both dependent and independent variables giving rise to spurious relationships had been discussed earlier under the section cross-sectional and longitudinal studies.

(iii) Objective versus Subjective Measures in Current Research

Subjective measures may be designed to emphasize reporting of objective characteristics (e.g. Karasek, 1979) although the conceptual distinction between subjective and objective measures mentioned earlier imply that factual information collected by self-reports are, strictly speaking, subjective data. While self-report of a "demanding" job undoubtedly includes an element of subjective perception of stress there is evidence of validity for an objective component. For example, Karasek and his colleagues (1981) found that analysis of variance of self-report measures of "job demands" revealed significant differences between occupational level and psychological strain. Other investigators have also reported that occupational level analyses of data collected by means of a similar measure of work load have shown distinct clusters of reported work load are associated with different types of occupations (Caplan et al, 1975).

Recent research (see section on measurement bias: common method variance) indicates that measurement problems associated with the use of self-report methods, for

instance, response bias, method variance, are not as serious as suggested (Spector, 1987b; 1988; Spector, Dwyer and Jex, 1987). Questionnaire items may be presented so as to balance out positive and negative worded items in order to avoid response bias arising from acquiescence.

Furthermore, the inclusion of certain features of research designs may compensate for the weaknesses inherent in the use of subjective measures. These include: (1) the use of "natural experiment" designs where self-selection factors are minimized and subjects are comparable on many other dimensions; (2) separation of dependent and independent variables in time (longitudinal data) and by using different methodologies; (3) use of stable trait markers to keep track of persistent influences on measurement, exposure to stressors, and on outcome.

In contrast with the prominent attention given to subjective questionnaire research, fewer reports have been published concerning the problems associated with independent, observer ratings, even in studies that have used observed ratings of stressors. Clearly, the same effects of self-report bias apply, as the independent observations are tied to the rater's cognitive and emotional processing. The correlation between stressors and dysfunctioning, in this case, tend to be systematically underestimated (Frese and Zapf, 1988) because the error variance from the independent observations are not related to the subject's reports of dysfunctioning, therefore, it decreases the correlation between observer's judgements and subject's reports. However, the use of scores averaged across a number of observer ratings provides a way of minimizing subjective bias from each individual observer, thereby enhancing inter-rater reliability.

A host of other practical and theoretical constraints are associated with using objective observer reports of work stressors. These include: (i) limited time available for observations because of hectic work schedules, thus, data may be recorded only during slack periods only, resulting in a loss of the representativeness of the variable being

investigated; (ii) unobservability of subject's mental processes e.g. mental workload demands; (iii) "Hawthorne" effects; (iv) accessibility, where companies may restrict access to certain areas of the workplace only. Finally, spurious effects due to confounding ("third factor") variables are also present in objective methods of assessment.

To an extent, the arguments for and against the use of subjective measures depends on the theoretical framework underlying the research. Two contrasting stress-theory formulations are evident. One approach assumes the existence of a unitary, underlying biological process (e.g. Selye, 1974) in which a single common pathway links diverse environmental stressors to diverse disease outcomes regardless of what specific environmental stressors or disease outcomes are involved. The other suggests that the stress state is linked to the person's subjective perception (appraisal, interpretation) of the environment, hence the variability of reactions to aversive stimuli (e.g. Cox, 1978; House, 1974a, 1981).

It is easy to see how research guided by the biological tradition has tended to base their measurements on objective assessment of variables. On the other hand, an exclusive reliance on objective measures would be contradictory to the basic notions expressed by cognitive models of stress. Under transactional and process-oriented cognitive models, stress is what is appraised by the individual. Ignoring the role of subjective perceptual processes would severe the critical link between individual differences in stress appraisal and response. Thus, within this theoretical framework, it is reasonable to assume that subjective perceptions of stress, as measured, would reflect more appropriately, the persons experience of the stressor and their concomitant reactions to that experience. One way of reducing measurement error from the various sources of bias discussed is to use multiple measures (both subjective and objective) in the collection of data.

(iv)Measurement Bias: Common Method Variance

Measurement bias (or measurement error) refers to the tendency of the instrument to record data which is systematically distorted in one particular direction (e.g. too high or too low values). Bias may occur as a result of inconsistent measurement procedures or they may be due to the characteristics of the instrument.

One form of measurement bias in studies of occupational stress which use a single procedure for data collection (e.g. self-report questionnaire or interview) is common method variance. The tendency of subjects to report attitudes and behaviour in a way which is more consistent than they are in reality may enhance correlation coefficients and account for false relationships that are found. Common method variance, therefore, refers to the component of the correlation that is due to bias common to the method of data collection. It is the variance arising from measurement attributes rather than the construct of interest. This problem applies to both cross-sectional and longitudinal research studies. Some of the most frequent sources of bias in self-report measures are acquiescence, social desirability and overlap of item content in questionnaire scales and measures.

Evidence for Common Method Variance

A survey of the literature on research which used self-report questionnaire methods for data collection revealed studies which reported evidence for method variance as well as those which showed little evidence of bias problems.

Spector (1987b) carried out an analysis of ten studies from the work stress literature that used self-report measures of perceptions of jobs, work environment, and affective responses to the job. Using the multitrait-multimethod procedure for detecting method variance developed by Campbell and Fiske (1959), Spector focused on the possibility of bias arising from social desirability, acquiescence, and spurious relations between self-reports (of affect) and objective data (e.g. absenteeism). Most of the work reviewed

involved well-validated scales with sound psychometric properties. Two studies showed evidence of method variance and these occurred at the level of single item measures. On the whole, Spector reported little evidence of method variance and concluded that problems associated with common method bias are largely a result of poorly designed scales.

Further evidence demonstrating that self-report measures of job stressors and stress outcomes do reflect the actual variable of interest has been reported by Spector, Dwyer and Jex (1988). In their study, data on seven types of work stressors were obtained from two sources: the job incumbent and the incumbent's supervisors. Multitrait-multimethod analysis of the data revealed reasonable convergent validity (the tendency of alternate measures of the same construct to correlate strongly), $r \geq 0.45$, for autonomy, workload, satisfaction, and hours worked between both sources measuring the same construct. Moreover, the validity coefficients of these four measures were higher than correlations with other variables, thus suggesting discriminant validity (the tendency for measures of different constructs to correlate, at most, moderately). In testing the four measures which showed significant convergent validity, Spector and his colleagues found little evidence for method variance. Their results also showed significant correlations between subordinate reports of outcomes and supervisor reports of stressors.

In contrast, Williams, Cote and Buckely (1989) reported that method variance was indeed present in a re-analysis of the data from the ten studies reviewed by Spector (1987b). Using confirmatory factor analysis, each of the studies was tested for goodness of fit on five confirmatory models. Williams et al found that method variance accounted for approximately 25 per cent of the variance in the measures examined by Spector. Other studies that investigated the effects of common method and have reported evidence of bias have used different methodological procedures for analyses (Glick, Jenkins and Gupta, 1986; Wagner and Gooding, 1987).

Although there seems to be widespread belief among researchers in the field of occupational psychology that method variance accounts for a considerable amount of shared variance among self-report measures, the conflicting evidence suggests no clear answer as to how serious method variance is. One possible reason for the ambiguity in the findings could be due to the use of different statistical methods of testing for the presence (or absence) of method variance. Certainly, scales which are psychometrically sound would be less prone to bias arising from acquiescence and item overlap. The use of multiple sources (objective and subjective measures) for data collection would further insure that bias arising from common method would be greatly minimized.

1.4.3 Measures of Stress Outcome

A variety of physiological and psychological measures of stress responses and stress-related health outcome have been used to assess the impact of job stressors. Holt (1982) lists some of the more important variables treated as effects or products of occupational stress. Research following the biological-medical tradition have tended to rely on physiological indicators e.g. serum cholesterol, catecholamine excretion, respiratory function, heart disease, mortality; all of these are objective measures in the sense defined in Section 1.4.2. Workers in the psychosocial tradition have, in similar fashion, based their outcome measures on psychological indices e.g. job dissatisfaction, anxiety, tension, depression, mental health, which are mainly subjective self-reports.

There are, however, problems with both of these types of measures as indicators of the effect of stress. The methodological issues in using subjective self-report methods were discussed earlier on. The use of physiological criteria as measures of stress outcome are evaluated in the following section.

Chapter 1

Physiological Assessment of Stress Outcome

McGrath (1970) has pointed out that changes in the recorded level of physiological indicators of strain may be caused by a range of stimuli and not necessarily the hypothesized stressor. Therefore, unless the investigator can specify *a priori* the environmental stressor of interest, physiological measures, although scientifically respectable, are not particularly useful. For example, heart rate, often used as a strain metric in reflecting the action of workplace demands, may be elevated by exercise, smoking, or the intake of certain drugs (see Cox and Mackay, 1978).

The validity of physiological measures of stress outcomes could also be affected by any of three types of stable, transitory and procedural factors (Fried, Rowland, and Ferris, 1984). People with a family predisposition to develop high blood pressure appear to develop higher levels of blood pressure under stress than people who are not prone to such a familial tendency (Light, 1981). Transitory factors like time of day, temperature, physical exertion of the subject under study, and consumption of caffeine and nicotine prior to measurement are all likely to affect levels of physiological indices. For instance, drinking coffee or smoking before or during measurement tends to increase the level of cardiovascular activity (Siddle and Turpin, 1980). Procedures in measurement may also give rise to inaccurate results. For example, the natural variation in the cardiovascular system prevents a single measure of blood pressure from being a reliable indicator. Therefore, truly reliable measures of blood pressure would require the subject to make several visits to a measurement point and several assessments per visit would be required (Rosner and Polk, 1981).

Cardiovascular indicators represent one of the most commonly used physiological measures of work stress. However, there is evidence to suggest that cardiovascular variables are highly responsive to acute stressful events (Drescher, Gnatt and Whitehead, 1980; Lynch et al, 1981). On the other hand, it is uncertain how chronic stressors affect

cardiovascular reactions (see Shapiro et al, 1979). It follows that cardiovascular measures should be used primarily for identifying acute rather than chronic work stressors. This implies that a major factor in deciding which physiological criteria is to be used in measuring stress reactions and health outcomes should be the characteristics of the work stressors investigated.

Apart from the validity issues described above, other constraining factors limit the use of physiological measures in work settings. Generally, physiological measurements are more time consuming, technically complex and more difficult to carry out in work settings than psychological measures obtained by means of questionnaire or interview.

Self-report measures, however, have been used to assess physiological responses to work environment demands. These measures assess level of activation (arousal), mood, and somatic state. Some studies have reported evidence of strong correlations between self-reported arousal and physiological measures such as heart rate, body temperature, respiration rate and skin resistance (Clements et al, 1976, Bohlin and Kjellberg, 1975). Moreover, it appears that self-reported arousal was more highly correlated with a variety of physiological indicators than individual physiological measures themselves (Mackay, 1980). This might suggest that self-report measures of arousal are better indicators of general physiological activation than many of the physiological measures.

1.5 Comment and Conclusions

In summarizing, the literature reviewed showed that many of the problems inherent in studies of stress are a result of poor research methodology. Attention was drawn to the problem of drawing causal inferences from cross-sectional and longitudinal research. Measurement error and bias from a variety of sources that might invalidate research findings were discussed. Evidence for common method variance was presented. One major consideration that has emerged from the review of the methodological issues in

current stress research concerns the use of psychometric measures. In order to avoid many of the measurement problems highlighted earlier, adequate, appropriate and reliable measures must be used in assessing the work environment and stress outcome.

While it may appear that objective measures of stressors, stress responses and health related outcomes are less likely to be affected by uncontrolled personal or contextual factors, there are many problems with using a strictly objective approach to the measurement of stress variables. The unresolved issues in physiological methods of assessing stress outcome suggests that no one particular type of outcome measure is better than the other. Therefore, adequate procedures are important when measuring physiological processes and researchers need to be aware of possible contaminating factors. While practical constraints in field research determine to a large extent the methodologies employed, it is important to be aware of the inherent limitations in research design and methods of measurement.

Chapter Two

Stress At Work: A Review of the Literature

Summary

This chapter presents a selective review of research that examined the effects of work stress on mental and physical health. Much of stress research has focused on three major areas of concern: (i) the work environment; (ii) individual differences in responses to stress; (iii) social support resources in mitigating work demands. The first part of this chapter evaluates research findings linking job content factors to occupational health. Subsequent sections review research on the role of personality dispositions in mediating the relationship between stress and illness. Studies reporting evidence of personality factors as stress moderators are reviewed.

The second part of this chapter is mainly concerned with social support in moderating the negative effects of work demands on health. A summary of conceptual and methodological issues is presented and evidence for the main versus stress-buffering model of social support evaluated. One of the key issues highlighted in the literature review concerns individual differences in the way people develop and access supportive social networks. In the light of the studies presented, the purpose of the present research is to investigate the following issues: (i) the relations between personality factors and perceived social support; (ii) the relations between personality dispositions and mental well-being; (iii) the main and moderating effects of personality factors and social support on work demands in relation to job satisfaction and psychological health; (iv) the Karasek demand-control, and the Johnson-Hall demand-control-support models of work stress in the prediction of health-related outcomes.

Chapter 2

2.1 Introduction

Research on the stresses and strains of work and work-related activities have examined relationships between a variety of environmental, organizational, and personality trait factors and an equally broad range of affective, behavioural, physiological and mental health outcomes. Investigators have concentrated on what may be described as two types of variables in the search for the causes of ill health: (i) the potential sources of stress in the work environment; (ii) the dimensions or characteristics of the person and situation. The link between these two sets of variables were described earlier in Chapter 1 (Section 1.2.4).

While transactional theories emphasize stress as a relation between the person and the environment, most of the earlier studies on work and occupational health tended to examine job factors and person-situation dimensions as distinct and independent sources of demands. Current approaches e.g. P-E-fit theory, demand-control-support theory, specify that it is the interaction of work, individual difference, and situational variables which determine either successful adaptation or maladaptive outcomes. Present work stress investigations, therefore, employ a broader research perspective and examine how environmental stressors and person-situation factors interact to influence affective, behavioural and physiological responses to work-related stressors.

Despite advances in our understanding of the pathogenic effects of work stress on well-being, the field is still lacking an integrative framework which can help explain the majority of research findings in a logical, theoretical and consistent manner. The House model (Chapter 1, Section 1.3.4), represents one attempt toward such a unified approach. The purpose of this review is to evaluate the current state of knowledge concerning the five major stages and causal links in the stress process described by the House model. Studies of physical environmental stressors e.g. noise, temperature, humidity, toxic substances, and physical work activity, have been well-documented elsewhere (see Poulton, 1978; Lindström and Mäntysalo, 1987) and are not of major relevance to the aims of this thesis.

They are not included in this review. During the last decade or so, two primary indices of occupational well-being, coronary heart disease (CHD) and mental health, have been used in many studies of stress. Fewer studies have focused on other physiological illnesses that are thought to be stress-related e.g. peptic ulcer, hypertension, respiratory illness and allergies. This review concentrates on studies of mental health and CHD but also includes other work when they contribute a new perspective to the topic.

2.2 Research on Work Environmental Stressors

Initially, industrial research on stress was mainly concerned with identifying the main factors that could determine job strain. Much of the earlier studies focused on the stressful elements of repetitive assembly work (Industrial Health Research Board, 1931, Cox, Dyce Sharp and Irvine, 1953) and its effects on fatigue, boredom, and mental well-being. These studies examined various task and job dimensions e.g. quantitative workload, machine pacing, utilization of skills, rest periods, in factories and production plants.

In 1953 and 1954, Kornhauser (1965) investigated the relationship between working conditions and mental health among car production workers in Detroit. He found that mental health was directly related to the individual's skill level, the lowest mental health scores being associated with repetitive, routine jobs. The higher the skills used, the higher the reported job satisfaction and level of positive well-being. Furthermore, this relationship did not appear to be caused by differences of previous job background or personality factors of the men who entered and remained in several types of work. This study highlighted the importance of job content factors, in particular, occupational skill level, as a predictor of strain and personal functioning. It was also one of the few early studies that assessed the possible influence of personality dispositions in the relation between work stressor and mental health, an important but often neglected consideration even in present day research.

Chapter 2

There have been many investigations of machine pacing since Kornhauser's research (Frankenhaueser and Gardell, 1976; French, Caplan and van Harrison, 1982; Marcson, 1970, Shepard, 1971). Perhaps one of the most well-known contributions that underscored the importance of repetitive assembly work as a predictor of stress and strain was the epidemiological (NIOSH) study carried out by Caplan, Cobb, French, van Harrison, and Pinneau (1975) at the Institute for Social Research, Michigan. They investigated the main dimensions of job stress as well as the effects of occupational status on health among a sample of over 2000 U.S. male workers across 23 occupations. Caplan and his colleagues found that somatic complaints were most frequent among assemblers and relief men working on machine-paced assembly lines; they also reported the most boredom and dissatisfaction with their work. Machine tenders were also very high on these measures. On the whole, these three groups of workers rated themselves most anxious, depressed and irritated, and reported the highest levels of stress and strain among the entire sample.

Experimental studies provide another line of evidence linking job and task characteristics to physiological strain and emotional distress. In a series of laboratory experiments which simulated particular aspects of the working environment, Frankenhaueser and her colleagues investigated the effects of various job factors e.g. workload (under and over stimulation), control, anticipation, and uncertainty on performance, arousal and physiological strain (Frankenhaeuser and Rissler, 1970; Frankenhaeuser, Nordheden, Myrsten and Post, 1970). The researchers found that boring and hectic tasks produced increases in catecholamine excretion, relative to baseline measures. Performance was found to deteriorate when subjects, who were exposed to either under or over stimulation, no longer responded to demands. These studies also demonstrated that beyond a certain level of demand, stress and strain will result. Other laboratory research have corroborated the Swedish findings and clearly established that the

pressures of externally imposed work demands are positively correlated with physiological indices of strain (Ettema and Zielhuis, 1971; Amaria, 1974; Johansson and Lindström, 1975).

These experimental findings have been validated by Frankenhaueser and Gardell (1976) in a field investigation of sawmill workers exposed to various levels of workload and machine pacing. The impact of control over work was also investigated. Both objective and subjective measures of stress were used (adrenaline and noradrenaline excretion, "outside" expert ratings of job characteristics and work environment, self-reports of psychological strain and ill health), strengthening the validity of the findings. Overall, the results indicated a higher incidence of cardiovascular risk and psychosomatic disorders among machine paced than non-machine paced workers. Machine paced workers reported the lowest well-being, were more irritable, and also had more nervous tension and sleep disturbances.

Further evidence linking specific features of assembly- and production-line work to self-reported health have been reported in the occupational stress literature. In a well-controlled study of some 205 workers in a large British motorcar manufacturing plant, Broadbent and Gath (1979, 1981) found that those engaged on paced assembly-line work showed higher levels of anxiety than toolroom workers whose tasks had no clear cycle. Non-repetitive work was also associated with higher job satisfaction although interestingly, there were no differences in mental health between the two types of work. While this study demonstrated that different kinds of production work (e.g. repetition and pacing) are related to different mental health symptoms, it also suggested that individual differences in personality are a contributory factor in the relationship between pacing and anxiety.

A somewhat different perspective which illustrate the links between work environmental factors and well-being can be found in the longitudinal investigation of group work redesign carried out by Wall and Clegg (1981). Using "before" and "after"

measures of perceived task characteristics, job attitudes, work behaviour and mental health outcome (as assessed by the 20-item GHQ), they demonstrated the positive effects of group autonomy and work identity on worker motivation, performance, job satisfaction and mental health among a sample of blue-collar employees in a manufacturing plant. Much earlier, Hackman and Lawler (1971) had proposed their job characteristics model of task design in attempting to elucidate the relationships between work tasks, job performance and worker satisfaction. The job characteristics approach (Hackman and Lawler) and the job diagnostic survey of Hackman and Oldham (1975, 1976), however, combines job factors such as autonomy, task variety, identity, feedback and task significance into a single index in examining individual responses to work although these "core" characteristics do not appear to be equivalent. Moreover, some investigators (e.g. Roberts and Glick, 1981) have commented on the theoretical and empirical shortcomings of the job characteristics approach, notably, that theoretical statements of the model are not entirely clear, and the lack of adequate instruments for assessing the constructs.

The focus on work environment factors identified specific occupational stressors (e.g. work overload, repetitive work) that were linked with strain, physical health and mental well being. The studies reported here also demonstrated the deleterious impact of constraining job and task characteristics on worker health, highlighting the importance of control as a stress-buffering variable. In addition, Frankenhaeuser and Gardell's findings provided the conceptual groundwork for alternative ways of looking at the work stress problem. For instance, the theoretical ideas underlying Karasek's interactive demand-control theory of work stress were drawn from the studies of the Swedish researchers.

Although more recent studies have found further evidence for the negative effects of cycle time, repetitive nature of tasks, and high work pressure on physiological and mental health (Ostberg and Nilsson, 1985; Smith, Hurrell, and Murphy, 1981; Vihma,

Nurminen, and Mutanen, 1982; Wallace and Buckle, 1987), there are a number of limitations associated with this phase of stress research.

Comment

A major drawback of the task characteristics approach was that it provided little insight into the underlying process of what it was about work that was stressful. For instance, in the area of machine pacing, it is unclear whether it was lack of control over the machine or the process, the speed of the work, the lack of opportunity to interact with others, or under-utilization of skills, that were important in explaining worker dissatisfaction and complaint. This raises the question of the relative importance of job and organizational factors in determining the effects of stress on work performance, job strain and well-being. In short, are some dimensions of the job stronger predictors of worker dissatisfaction and strain than others? Except for Kornhauser's landmark study, most of the earlier research did not address this problem.

A second related issue concerns the question of whether work stressors act independently, or if its pathogenic effects depend on the presence (or absence) of other contributory factors. Whilst the early efforts at understanding the nature of work stress highlighted the complex relationships linking excessive job demands, overload, and lack of control to strain and dysfunctioning, many of the investigations were not explicitly formulated to investigate the joint interactive effects of such stressors on health-related outcomes. The problem is clearly illustrated in the research programmes conducted by the Michigan group at the Institute for Social Research. Apart from demonstrating occupational differences in work demands and health, some of the NIOSH data, (Caplan et al, 1975) also showed that there was a greater proportion of cigarette smokers who quit smoking among men who reported lower job stress (e.g. work load, time pressure) although this association held only for those who were low on work social support. On the whole,

only first-level analyses of the data were carried out, hence only main effects were reported. Thus, with no a priórí hypothesis or conceptual framework (e.g. interactive models of work stress such as "demand-control-support" theory) to guide the research, the task of testing for such effects and interpreting the complex associations found becomes even more difficult.

Finally, this phase of research paid little attention to the role of personality dispositions in the stress process. This somewhat narrow perspective is illustrated in many epidemiological investigations, which contributed much to knowledge about the health effects of work stressors and demographic characteristics (Caplan et al, 1975; Margolis, Kroes, and Quinn, 1974; Jenkins, 1971) but neglected the combined influence of environmental, psychological and personality factors as precursors of strain.

On the whole, the studies reported here were guided by relatively simple models in that investigators typically focused on how variations in a single work stressor (e.g. work load, noise) were associated with changes in measures of strain and health. Whatever may be the prevalence of stress-inducing factors, it is clear that people will vary within a group in the degree to which they can cope. The linear models which motivated the research reported above could not adequately explain why individuals react in different ways under similar demands; few studies considered that stress responses and outcomes could be better explained by a combination of variables. For instance, high workload demands may not induce high strain when adequate levels of job discretion or control are also present.

This limitation is noted by Kasl (1978) who, in commenting on the findings reported by the Michigan research group, stated that given the size of the NIOSH research effort (Caplan et al, 1975) which "*only presents 'main effects and occupational differences', the results were rather disappointing*" (p. 21). His statement is given further emphasis by Robert Karasek (1979) who pointed out that rarely are the issues of work control and job demands discussed together. This underscores the need for theoretical approaches which

take into account the multiple dimensions of work characteristics and their interrelationships as stressor agents. The use of models which explicitly specify the role of interactive predictors of strain is a fairly recent development in work stress research. The conceptual basis of such a model, the Karasek demand-control theory, was described in Chapter 1. Within the general area of work stress, research has investigated a number of psychosocial variables which may operate as possible stress-buffers.

In addition to the potential moderating role of individual difference factors on work demands, there is another way in which personality dispositions may have important effects on the stress-illness relationship. An increasing number of field studies on work stress are based on self-report questionnaires. Evidence from research indicates that personality dispositions such as negative affectivity influence perceptions of environmental demands and psychological health. This finding further strengthens the need to identify and include personality dispositions that may contribute to understanding the relationships between work and health. The following sections evaluate research on individual differences in the stress process.

2.3 Individual Differences in the Stress Process

In 1974, Kasl commented that efforts to elucidate the effects of personality dispositions on the experience of stress were scattered and unsystematic. This trend has, in the last decade or so, shifted toward an increasing interest in the way personality dimensions mediate the link between stress and health, mainly because of the development of cognitively mediated stress theories. Such approaches emphasize the role of cognitive appraisal processes and are formulated on the assumption that the experience of stress as a subjective state is a function of the evaluation of objective factors (e.g. characteristics of the job and other work-related conditions) whether the appraisal is accurate or not. In some situations, stress may occur as a result of the appraisal of environmental conditions which

are benign. Conversely, a dangerous situation may be perceived as harmless and not lead to feelings of stressfulness. Thus, perceptions of the objective environment and stress are *moderated* by individual difference, situational factors and the coping-adaptation process. The links between these variables are shown in the House model (Chapter 1, Section 1.3.4). Personality characteristics, therefore, influence perceptions of work conditions as well as self-evaluations of health status. In addition, personality trait factors have also been hypothesized to afford protection against the deleterious effects of various types of stressors, analogous to the concept of physiological constitution. Clearly, the emphasis here is on how people appraise and respond to external stimuli.

There are at least two ways in which personality dispositions may be important in understanding the link between stress and health disorders. While significant correlations between, say, locus of control and perceptions of job conditions (or reported symptomatology) may reflect genuine underlying relationships, the question is how much of this association is due to response bias effects such as social desirability in measuring locus of control, and how much "resistance" or protection against stress do personality trait factors such as control beliefs actually provide over and above that arising from "bias" effects.

Several individual difference variables have been investigated as potential stress-buffers in the field of work stress. Obviously, a full consideration of all of them is beyond the scope of this review. The following section will consider only those personality trait variables that have been identified as significant stress-moderator variables; it will evaluate research on individual difference variables directly related to the experience of stress-strain, and the psychosocial resource social support. Specifically, the review is concerned with: (i) personality factors in the perception of stress and the development of psychological strain; (ii) personality factors as moderators of the stress-strain relationship; (iii) the role of social support and personality trait factors as stress-moderators.

2.3.1 Personality Dispositions and Perceptions of Stress at Work

Many empirical studies of work stress have relied heavily on subjective measures in assessing the work environment and psychological distress. Generally, these studies assume that self-report evaluations of the work environment reflect actual objective conditions. While this research has generally been quite successful in establishing correlations between some types of work stressors and affective and behavioural outcomes, conclusions regarding the causal nature of the stressor-outcome relationship are open to question because of the almost total reliance on self-report data on both measures of stressors and outcome. The methodology problems associated with self-report data were discussed briefly under the section on common method variance in Chapter 1 (Section 1.4.2). In addition to the methodology issues, evidence from empirical research indicate that perceptions of the work environment are correlated with self-reported outcomes.

The substantive question is whether personality dispositions mediate the relationship between objective environmental conditions and subjective perception of these variables as stressors. More important, the objective in investigating personality factors is to provide a means of determining how much of the discrepancies in the assessment of these variables can be attributed to measurement error, to real differences in the environment, and to differences in the way people interpret the threats and opportunities in their work situation. Conceptual theorizing and evidence from empirical studies indicate that the two personality dispositions most likely to affect perceptions of work conditions, task characteristics and symptom reporting are negative affectivity and locus of control.

(i) Negative Affectivity and Self-Report Measures

The construct of negative affectivity (NA), first used by Tellegen (1982), was defined by Watson and Clark (1984) as a mood-dispositional dimension which reflects pervasive individual differences in negative emotionality and self-concept. They noted that

several specific personality measures, notably, neuroticism (Eysenck and Eysenck, 1975), trait anxiety (Spielberger, Gorsuch, & Lushene, 1970), repression-sensitization (Byrne, 1961), and social desirability (Edwards, 1957), all intercorrelated so closely that they probably measured the same construct, which they termed negative affectivity (NA). In their seminal review of the literature, Watson and Clark demonstrated the stable dispositional nature of NA and concluded that: (i) high NA individuals are more likely to experience significant levels of distress in any situation than low NA individuals; (ii) high NA individuals also tend to focus on the negative aspects of themselves, other people, and the world in general (they accentuate the negative). Evidence supporting this differentiation of NA is illustrated in a number of studies in which high NA individuals, for instance, are reported to significantly overestimate the size of failure-related stimuli (Zahn, 1960) and interpret ambiguous stimuli more negatively (Haney, 1973; Phares, 1961). Because the construct of NA is a relatively recent development, NA has been mostly investigated either as neuroticism or trait anxiety in stress research. It is the neuroticism component of negative affectivity that is discussed as a possible source of influence in the perception and experience of work-related stress.

Neuroticism

The personality dimension of neuroticism is characterized by emotional responsiveness, in which the person is in a state of unease about the uncertainty of events. Individuals with high scores on the neuroticism scale tend to be upset, distressed, and have a negative view of themselves. From a theoretical viewpoint, neuroticism is therefore one of the most obvious personality variables that may be linked to perceptions of stress, since, by virtue of its conceptualization, those who score highly on this dimension are described as *"anxious, worrying individuals, moody, ... overly emotional, reacting too strongly to all sorts of stimuli"* (Eysenck & Eysenck, 1975). Such persons would therefore be hypothesized to report more negatively about their environment, and also report greater

levels of distress. The majority of researchers have investigated neuroticism in the form of trait anxiety (Taylor, 1953; see Spielberger 1972).

In looking at the relationship between role conflict and psychological strain, Kahn (1973) found that objective role conflict (assessed by summing the scores across four components of the construct reported by members of the focal person's role set) was consistently negatively related to psychological strain (operationalised as job-related tensions, job satisfaction, confidence in the organization, and the intensity of experienced conflict). However, in subsequent analyses which examined possible mediating factors in the relationship between role conflict and individual responses, Kahn also found that under high role conflict conditions, people who were anxiety prone tended to experience the conflict as more intense and reacted to it with greater tension than those who were not anxiety prone. Although this study suggests that anxiety levels are related to the experience of stressfulness, the author did not report statistical controls for anxiety proneness in subsequent analyses of the relationship between role conflict and strain measures.

The importance of controlling for response bias resulting from personality dimensions is further illustrated in a longitudinal study of mental health, life events and social support by Henderson and his colleagues. They found that neuroticism, as measured by the Eysenck Personality Inventory (Eysenck & Eysenck, 1975), was highly correlated with the GHQ measure of mental health. Neuroticism accounted for 69% of the overall variance when included in a regression analysis, totally swamping the effects of social support and life events. (Henderson, Byrne, & Duncan-Jones, 1981).

Further empirical evidence which points to the association between neuroticism and stress perceptions has been reported by Payne (1988). This longitudinal research of unemployed men was based on the demands-support-constraints model of stress in which stressors were conceptualized in terms of the problems faced by the subjects and the opportunities and supports available to them. The data were all entirely self-report

measures, collected over a period of two years in three phases. In the last phase of the study, the Eysenck Personality Inventory was used to measure neuroticism and extraversion-introversion. The results revealed that neuroticism was very strongly correlated with the affective symptom measures GHQ12 (r = 0.41), anxiety (r = 0.69), depression (r = 0.57), [figures for employed sample] and with measures of perceived stressfulness of the environment including financial problems but not with social support. Neuroticism was also very highly correlated with all of the affective measures including anxiety, depression, and the GHQ12. Furthermore, the effect of including neuroticism in subsequent regression analyses of the data replicated Henderson et al's (1981) findings; when trait neuroticism was entered as the first variable in the multiple regression equations, it accounted for so much of the variance in each of the outcome (affective) measures that none of the other predictors contributed any amount of incremental variance to the model.

However, significant correlations between trait anxiety and appraisals of stress are not always obvious. Edwards and Endler (1989) examined the relationships between trait anxiety, situational appraisals, and state anxiety responses among a sample of 42 male and female adults over a period of six weeks. The participants identified and described the most stressful situation they experienced each day, completed an appraisal of the situation, and recorded their reactions to the situation. Their data showed that, on the whole, trait anxiety was not related to reported appraisals (perceptions) of stressful situations although participants who had high scores in trait anxiety reported more conflict situations than their low anxiety counterparts. One possible interpretation for this finding may be the use of the four situational dimensions of trait anxiety (rather than a single index) which may diffuse the overall effect of anxiety in accounting for the total amount of variance. It was not clearly stated whether the investigators attempted to derive a composite index of trait anxiety in their analyses.

In another study, Janman et al (1988) investigated the mental health of psychiatric nurses. They found that neuroticism was highly correlated with some dimensions of the job demands scales e.g. 0.26 with aversive demands, but not with administrative demands (r = 0.02). Neuroticism, however, correlated with all but one of the support-constraints variables (social attitudes).

Finally, Brief et al (1988) examined the effects of negative affectivity (as measured by the Taylor Manifest Anxiety Scale, Taylor, 1953) on self-report measures of job stressors and strains among a sample of 497 managers and professionals. They reported that NA correlated significantly with all measures of perceived stress and strain, the correlation coefficients ranging from 0.24 for job satisfaction to 0.69 for depression symptoms.

Comment

Apart from these investigations, few studies of stress, in particular, occupational stress, have examined trait anxiety or neuroticism as a predisposing factor in subjective evaluations of stress and symptom reporting. Taken as a whole, the evidence suggests that negative affectivity affects the perceptions of a range of environmental variables and is a potential source of response bias. Future research should therefore include some measure of negative affectivity, particularly in studies which use subjective self-report methods of data collection. Statistical procedures should also be used to partial out the variance due to negative affectivity in order to estimate the proportion of bias. The problems associated with negative affectivity were noted and the NA construct was measured in terms of neuroticism in the present studies.

(ii) Locus of Control and Self-Report Measures

The locus of control construct refers to a generalized expectancy about the extent to which people assume they can control events and outcomes. Perhaps the best known formulation of the locus of control construct is Rotter's (1966) concept of internal versus external locus of control. Persons characterized as internals believe that outcomes are determined largely by personal initiative, skill, and effort whereas persons classified as externals believe that outcomes are determined not by one's actions but largely by other people, luck, chance, or fate.

There is an extensive literature that suggests personal control beliefs modify people's behaviour in relation to social-environmental exchanges. Phares (1976) wrote that "*in contrast to externals, internals exert greater effort to control their environment, exhibit better learning, seek new information more actively when that information has personal relevance, use information better, and seem more concerned with information rather than with social demands of situations*" (p. 78). Thus, in searching for personality dimensions which may be related to perceptions of stress it is therefore not surprising for investigators to hypothesize that internals and externals would differ in their perceptions of job characteristics and in their reactions to those characteristics. Specifically, because internals perceive they have greater control over their environment they would tend to perceive their jobs as providing more autonomy, greater freedom and therefore perceive less stress arising from these job factors than external locus of control individuals.

Locus of Control and Perceptions of Stress

A number of investigators have examined the association between locus of control and role-stress arising from role ambiguity, role conflict and role overload.

In one study, Keenan and McBain (1979) investigated the relationships between role-stress, psychological strain and personality characteristics among a sample of 90

middle managers in a large public organization. Results from their data showed that locus of control (as measured by a 23-item Rotter Scale, 1966) was not correlated with role ambiguity (r = 0.08), role conflict (r = 0.04), or role overload although the correlation coefficient was - 0.18 for this role-stress measure. In contrast, Organ and Greene (1974) reported that locus of control correlated 0.42 with role ambiguity for a sample of scientists and engineers and 0.21 for supermarket managers. Batlis (1980) also found significant correlations between locus of control and role conflict (r = 0.19) but not with role overload. However, there was no significant correlation between locus of control and job satisfaction, while most studies have consistently reported this association. As a result of this discrepancy, it is difficult to compare the Batlis study with other reported findings.

In summarizing a wide review of research relating locus of control and prediction of the job characteristics, Spector (1982) noted that *"the literature on the relation between perceived job characteristics and locus of control is inconsistent and inconclusive. The studies included here that reported a relation between I-E and job characteristics were consistent in showing that there may be differences in perceptions, but they were inconsistent in demonstrating a direction of relation"* (p. 492).

Since Spector's review and comment, a number of recent studies have reported findings concerning locus of control and perceptions of work stress. For instance, Marino and White (1985) assessed locus of control, four dimensions of organizational structure (perceptions of job codification, job specificity, hierarchy of authority, lack of participation) and perceived job stress in a hospital setting using self-report questionnaire. They found that locus of control was significantly correlated with "hierarchy of authority" (r = 0.21, $p \leq .05$) but not with the other three organizational characteristics. (An interaction effect was found only for locus of control and job specificity, a measure of formal operating procedures in the work place.)

Chapter 2

It was mentioned at the beginning of the section on individual differences that a substantive issue concerned the extent to which established relationships between personality dispositions and perceptions of job conditions (or reported health status) may be affected by response bias effects due to instrument reactivity. Data from Furnham and Henderson's (1982) experimental studies of three types of response bias (fake good, fake bad, and fake mad) in questionnaire measures suggest that the locus of control construct, as measured by the Rotter (1966) scale, is sufficiently robust and not susceptible to either positive or negative response bias. He concluded that the locus of control questionnaire measure is moderately insensitive to faking.

On the whole, it appears that the evidence linking locus of control to perceptions of work have not changed much since Spector's analysis and comments. Locus of control is related to some dimensions of work but not others. Unfortunately, not many studies have looked at both neuroticism and locus of control and it is therefore uncertain how much of the correlation values are due to the neuroticism component. Furthermore, many of the studies did not specifically carry out statistical analysis aimed at estimating the proportion of variance that could be accounted for by locus of control in the perception of job characteristics and reported symptoms or disorder. This aspect of the problem was investigated in the present thesis. Specifically, one of the objectives of the work was to examine the extent to which control beliefs are related to perceptions of the work environment.

2.4 Individual Difference as Moderators of Stress and Illness

There is also another way in which personality dispositions may be important in accounting for differences in peoples' reactions to the same noxious stimuli. The preceding review of the literature on work environment stressors noted that, in the early 1970s, stress research was dominated by attempts to conceptualize, identify, and measure stress and its chronic effects on emotionality and personal functioning. While some researchers were concerned mainly with occupational stress, studies of stressful events and life crises in predominantly non-work settings revealed that the vast majority of people exposed to the same stressors did not suffer similar health disorders. It was observed, for example, that people responded differently to the same traumatic events e.g. war, natural catastrophes, life crisis, and bereavement (see Hinkle, 1974; Cohen & Syme, 1985, for summaries of this literature). The human system's reactivity to stress appeared to be moderated by certain vulnerability or resistance factors (Kessler, 1979). Personality dispositions can therefore mediate the stress-illness relationship either through the person's appraisal processes, by means of specific dispositional trait patterns such as hardiness, or a combination of both processes.

A considerable amount of research has been carried out to show how personality characteristics can moderate workplace demands and affect work performance. Moderating factors are defined as those variables that affect the direction and or strength of a relationship between an independent variable, or predictor, and the dependent variable (Baron and Kenny, 1986). In the present context it refers to that subset of work environment and trait variables which act to buffer or protect the individual from the demands of the workplace. Mediating effects describe *how* or *why* certain relations between the predictor variables and the dependent variables occur. This distinction is of significance because of the need to understand if, for instance, job outcomes like work

satisfaction, are responsible for buffering people from stress at work, or, if they provide a means of absorbing the deleterious effects of such stresses.

Some of the personality trait factors that have been studied include "hardiness" (Kobasa, 1979; Maddi & Kobasa, 1984) coping styles (Fleishman, 1984), locus of control (Lefcourt, 1985; Wheaton, 1982), and the Type A behaviour Pattern (Friedman and Rosenman, 1974; Haynes, Feinleib and Kannel, 1980; Matthews and Haynes, 1986).

(i) Locus of Control

Several investigators have examined the locus of control construct in relation to work demands, work performance, job satisfaction and mental health. In one study, Anderson (1977) investigated the relationships between these variables among a group of 90 managers after their operations had been disrupted by a flood. His results showed that locus of control (assessed by a 29-item I-E Rotter scale) was highly correlated with perceived stress, $r = 0.61, p \leq .001$. Internals were found to perceive less stress, employed more direct and fewer emotion-centered coping behaviours than externals in recovering from the effects of their environmental experience. Furthermore, it appeared that internals who successfully recovered their business operations scored even higher in internal LOC orientation two and half years later. Unsuccessful externals, on the other hand, became more external. Anderson interprets the results as indicating reciprocal relationships between locus of control and environmental influence. Although this study did not specifically test for the interactive effect of locus of control and perceived stresses the results do indicate differences between internals and externals in relation to performance and coping behaviours. Furthermore, the findings suggest that internal locus of control is an important prerequisite for successful entrepreneurs and should be considered in studies of such occupational groups.

Chapter 2

Research using the Rotter locus of control scale have generally reported that subjective autonomy beliefs are negatively associated with job strain; thus, employees with greater internal scores were found to exhibit lower levels of psychological distress (O'Brien, 1984a; Spector, 1982). Spector also argued that internal control is associated with greater overall job satisfaction although some studies have reported non-significant correlations between internal locus of control and specific types of satisfaction at work (e.g. with coworkers and supervisors). Furthermore, externals also tend to report higher levels of depression.

More recently, Krause and Stryker (1984) explored how locus of control mediated the impact of stress on well-being. Data from the 1969 and 1971 panel interviews of the U.S. National Longitudinal Study of middle-aged men were analyzed to assess the mediating effects of locus of control beliefs in the relationship between stressful job, economic events, and psycho-physiological well-being. The sample was divided into four groups: extreme internal, moderate internal, moderate external, and extreme external. Using multiple regression procedures and controlling for demographic differences in age, marital status, race, education, occupation, income and health status in 1969, analysis of the data showed that internal LOC individuals responded more adequately to stress than external LOC individuals. Further detailed analysis revealed that moderate internals cope more effectively than those whose LOC orientation were classified as extreme internal, extreme external, or moderate external. Thus, moderate internal LOC orientation appears to reduce the negative impact of job demands and stressful economic events.

In expanding on these findings, Krause and Stryker argued that both extremely internal and external persons may be especially vulnerable to life crisis, and under stressful situations, extreme internals may be so overcome with a sense of personal responsibility that they may suffer from anxiety and depressive reactions. Further supportive evidence for this interpretation has been reported in a study of older adults (Krause, 1986). The

results from this study showed that extreme internals and externals reported more depressive symptoms. Thus, it appears that a finer differentiation between internal and external LOC orientations can reveal significant patterns of stress and coping behaviours. Differences between internals and externals in the way they make use of social support in coping with their problems have also been found (Lefcourt et al, 1984; Sandler and Lakey, 1982).

Batlis (1980) however, found no support for locus of control as a stress moderator among a sample of supermarket managers. In another longitudinal study, Solomon, Mikulincer and Avitzur (1988) investigated the joint interactive effects of locus of control and social support in moderating the effects of post-traumatic stress disorder (PTSD) among a sample of 262 Israeli soldiers who were diagnosed as "combat stress reaction" casualties. They reported that locus of control (assessed by a shortened version of the I-E Rotter scale, 1966) was significantly correlated with PTSD at both Time 1 and Time 2 and with emotion-focused coping. However, results from the multiple regression analyses of the hypothesized locus of control and perceived social support interaction was non-significant. The lack of interaction may partly be due to the global nature of the social support measure used in this study, and the lack of delineation of different types of support.

The problem of measurement bias arising from instrument reactivity and personality factors were illustrated and discussed at the beginning of this chapter. Recently, Krause (1985) examined the effect of social desirability response set bias on the interaction between locus of control beliefs and stressful life events, and psychological well-being. Analysis of the data revealed no statistically significant interaction effect of locus of control and stress on depressive symptoms when social desirability was not included in the regression model. Once controls for social desirability were included in the regression, the interaction effects increased and were statistically significant. Krause, however, used only a single-item of the Rotter I-E scale in assessing control beliefs.

An even greater number of studies have investigated locus of control beliefs as stress moderators in non-occupational settings, particularly in the area of life events and life stress. Lefcourt (1983) provides a comprehensive review of this research and his conclusions are very much similar to that presented in the following summary, in that externals experience greater strain than internals, even in the absence of stressful life events.

Comment

Most of the research reported in the present review on locus of control have used the Rotter I-E scale in measuring control beliefs. On the whole, little attempt has been made to establish the convergent validity of the scale through the use of alternative measures. An important point that concerns current research is that there appear to be some degree of overlap between measures of locus of control and affective outcome, in particular, anxiety (Archer, 1979). In commenting on this aspect of the problem in relation to task performance, Spector noted that *"It may well be that anxiety rather than locus of control explains why internals seem to learn better than externals. Obviously, additional research is needed to ascertain the joint role of anxiety and locus of control in task performance"* (p. 484).

Many investigators seem to have disregarded two major issues concerning the locus of control measure in formulating their research. First, locus of control is a multi-dimensional construct (Phares, 1976) and second, although Rotter (1966) originally conceptualized it as a generalized expectancy of control beliefs, much of the empirical evidence indicates that people's beliefs about the extent to which they can influence outcomes is situation specific. The multi-dimensional nature of the construct is well illustrated in recently developed scales designed to assess specific control beliefs, for example, the Health Locus of Control Scale (Lau, 1982), which also turned out to be multi-

dimensional showing four sub-factors: self-control, provide control, chance, and general health threat. Most studies, however, assessed LOC as a single dimension using the Rotter I-E scale which measures LOC beliefs in general and wide ranging situations.

In a recent review on the moderating role of personality characteristics in the relationship between stress and ill health, Cohen and Edwards (1989) concluded that generalized internal locus of control was the only personality factor which showed consistent effects of stress buffering. This conservative interpretation underscores the various methodological limitations due to weak conceptualization of key variables, inadequate measurement and statistical treatment of data in many of the studies evaluated in Cohen and Edward's review. Overall, the literature indicates that locus of control is an important moderating variable in buffering the effects of work demands. In anticipation of the problems that might arise with the use of the more broadly conceptualized Rotter I-E scale in research on work demands and social support, a more specific LOC measure appropriate to the aims of the present research was used.

(ii) Type A Behaviour Pattern

Evidence from a considerable number of prospective epidemiological studies (Barefoot, Dahlstrom and Williams, 1983; Friedman, Thoresen, and Gill, 1984; Haynes, Feinleib and Kannel 1980; Orth-Gomér et al, 1985; Rosenman et al., 1975; 1964) has shown that the Type A behaviour pattern is an independent risk factor for coronary heart disease (CHD). The Type A Behaviour Pattern (TABP) describes a set of *"behavioral dispositions such as ambitiousness, aggressiveness, competitiveness, and impatience, including specific behaviors such as muscle tenseness, alertness, rapid and emphatic voice style and the pace of most activities, and emotional responses such as irritability and increased potential for hostility and anger"* (Rosenman, 1983). Friedman and Rosenman also noted that the TABP emerges only when certain challenges or conditions of the

environment (or job) arise which elicit a particular complex of responses like competitiveness, ambitiousness, impatience and a high need for achievement. Thus, these characteristics are exhibited by people in the presence of appropriate environmental events. TABP is, therefore, an action-emotion complex which involves interaction between the person and the environment. Although this conceptualization of Type A behaviour is probably one of the most widely accepted, there are currently numerous different definitions of the construct. Glass (1977) presented a description of Type A as: (1) competitive and achievement striving; (2) exaggerated time urgency; (3) aggressiveness and hostility. Type B behaviour is characterized by the relative absence of these attributes and is typically defined as the lower 50th per cent of scores in self-report questionnaire measures.

Several assessment procedures of Type A behaviour have been developed. The structured interview method (SI; Rosenman, 1978) is generally credited with the highest reliability and accuracy in the prediction of Type A. It is mostly used in clinical settings. Self-report questionnaires e.g. the Jenkins Activity Survey (JAS; Jenkins, Zyzanski, and Rosenman, 1971), Framingham Type A Scale (FTAS; Haynes et al 1978), Bortner Rating Scale (Bortner, 1969), are more common in work stress research. Although independent validation studies of the three questionnaire measures have reported relatively high reliability coefficients the correlations of these scales with the structured interview method of assessment are less impressive, for instance, the JAS and SI have been found to assess different aspects of the Type A pattern (Matthews et al, 1982; Musante et al, 1983). As with all self-report measures, they may be affected by response biases such as social desirability of Type A attributes, social class, and gender. More important, they cannot provide a challenging environment to elicit Type A behaviour indicators. This is a major limitation because the notion of challenge is central to the task of defining Type A behaviour.

Chapter 2

Theories about occupational stress have recently begun to incorporate the TABP as an integral feature of their models. Type A behaviour is a particularly relevant phenomena in work stress research because its conceptualization is centered around achievement orientation, competition and a hard driving style of life, aspects of which are commonly found in the work environment of many Western industrialized nations. It is therefore easy to see how the TABP is considered a risk factor in worker health. Type A behaviour is usually conceived as a moderator of sources of stress and strain.

The work stress literature suggests that, relative to Type B individuals, Type As tend to appraise their work environment as more demanding. They report heavier work load, more job responsibility, longer work hours, greater levels of work activity and productivity (1980; Kelly and Houston, 1985; Kirmeyer and Biggers, 1988). Occupational and socio-economic differences between Type A and Type B individuals have also been reported, for example, the greatest prevalence of Type A behaviour (71%) was found among male professionals, employers and managers, and in the highest socio-economic groups (Health Promotion Trust Research, 1987).

Both cross-sectional and longitudinal epidemiological studies generally indicate that Type A men are twice as likely to experience CHD that is independent of the traditional biomedical risk factors for heart disease (Friedman, Thoreson and Gill, 1981; Siegel, 1984). Further empirical studies have demonstrated that Type A persons exert greater efforts at performing their jobs (Jamal, 1985), experience greater negative health effects arising from work role ambiguity (Howard, Cunningham and Rechnitzer, 1986), and have a tendency to adopt performance standards or goals in excess of their performance potential with adverse psychological consequences of dissatisfaction and increased risk for feelings of distress for not achieving personal goals (Ward and Eisler, 19887). A number of studies have also reported significant interactions for Type A personality and work stressors (Hurrel, 1985; Ivancevich, Matteson and Preston, 1982; Orpen, 1982).

Chapter 2

There are a number of possible mechanisms which may account for the general findings concerning Type A persons and their perception and response to occupational demands. One approach relates the Type A pattern to an overly strong need to control stimulus events (e.g. Glass, 1977). As considered earlier, personal beliefs about control can help to alleviate stress. Thus, Type A behavior represents a coping style (elicited by environmental stress) that is intended to maintain or regain control over the environment. This view is well supported by empirical findings, for example, compared with Type Bs, Type As have been found to report a higher desire for control (Burger, 1985; Dembroski, MacDougall and Musante, 1984) and to respond to threats to control with greater psychological reactance (Carver, 1980; Rhodewalt and Davison, 1983). The Type A individual, however, appears to require extensive control over the psychosocial work environment. Thus, in the work situation, stress may be induced from work relationships in which control over other people is often difficult to achieve unless the Type A person is at the higher levels of an organization. Increased stress may also arise when it is clear that the continued need for control cannot be achieved or is lost. These conditions relating to Type A behaviour, therefore, constitute vulnerability factors in the stress process.

Recently, there has been considerable debate regarding the primary factor responsible for increased CHD. Psychometric assessment of the major methods of measuring Type A behaviour have found discrepancies concerning the number of theoretical factors underlying the TABP construct. While earlier research emphasized the totality of the TABP syndrome (Jenkins, Zyzanski and Rosenman, 1978) more recent findings point to the centrality of the aggressiveness factor which is associated with competitiveness and achievement. Dembrowski et al (1981) found that mere achievement motivation or job involvement did not predict CHD. Furthermore, aggression and hostility have been reported to predict not only illness and mortality from heart disease, but also from a range of diseases (Shekelle et al, 1983; Williams et al, 1980).

Comment

In summarizing their review of epidemiological research on Type A behaviour and CHD, Matthews and Haynes (1986) pointed out that one of the most urgent issues for future research was to investigate whether the link between Type A behaviour and CHD were prevalent in ethnic groups other than American middle class males from which most of the research data was obtained. While results from prospective studies are generally consistent in showing that Type A personality is related to incidence of CHD, the samples are mainly drawn from American, white collar, middle-class males.

There are a number of outstanding methodological issues that require further investigation. These concern the use of different measures of Type A behaviour in research and statistical procedures in data analyses. For example, some studies appeared not to have controlled for coronary heart risk factors other than Type A behaviour. From a conceptual viewpoint, it would appear that both Type A behaviour and locus of control would jointly influence the perception and experience of stress. This approach implies a "moderator" of a moderator effect and empirical support for such a hypothesis would have to come from well specified models which clearly define the direction of the effects. Finally, because the relationship between Type A behaviour and diseases other than heart and vascular diseases has not been investigated sufficiently, conclusions concerning the specificity of the link between Type A personality and CHD remains tentative. There is ample evidence to suggest that Type A behaviour is a vulnerability factor and moderates the relationships between stressors and strains, at least when these variables are measured by self-report. Whether these findings are tenable if stressors were measured objectively and strains assessed physiologically is open to empirical testing. Studies which investigated these issues in occupational studies of health are, however, rare or non-existent in the literature.

The general picture that emerged from the studies reported here indicate that trait neuroticism, locus of control and Type A behaviour are related to each other and to other

personality dispositions. For example, it was mentioned earlier that measures of locus of control as well as Type A behaviour are closely associated with anxiety, which is also highly correlated with trait neuroticism. Thus, any one of these three individual difference measures, in particular, negative affectivity, may be a confounding factor in studies which attempted to relate personality traits e.g. Type A behaviour or locus of control to psychological strain. In addition, the personal resource of "hardiness", may further complicate the issue as it has been reported to be positively related to locus of control. In a study of the moderating effects of the hardy personality on stressful life events and illness, Kobasa (1979) found that high stress-low illness executives were more internal and showed higher levels of "hardiness" compared with a high stress-high illness group. Further empirical evidence which suggest the mitigating effects of the "hardiness" personality on symptomatology and health have been reported in longitudinal investigations (Kobasa, Maddi and Kahn, 1984).

Although the studies reported in this review are drawn from a relatively narrow range of theoretical concepts and occupational settings, and hence any conclusions that can be made are limited, the brief review does show the pervasive effects of these personality dispositions on the stress process.

Chapter 2

2.5 Social Support as a Resistance Resource

2.5.1 Introduction

Researchers in work stress have sought to identify personality factors and psycho-social resources which may reduce or eliminate the negative effects of environmental demands on worker health. Studies which examined personality characteristics in stress resistance were presented above.

One of the social resources that has been found to be consistently related to health outcomes is social support (Cassel, 1976; Cobb, 1976), a term widely used to describe the mechanisms by which interpersonal relationships may protect people from the deleterious effects of stress. Researchers noted that strong social ties appeared to lessen the risk of psychosocial and physical impairment. Conversely, there was a greater risk of mortality and morbidity among isolated individuals. Since then, numerous studies have investigated a variety of social connections, for example, attachment to family, affiliation with peers, number and frequency of social contacts, and functional support, in mitigating the effects of stress on health (for reviews see Albrecht & Adelman, 1984; Cohen & Syme, 1985; Ganster & Victor, 1988; Leppin and Schwarzer, 1990; Kessler, Price & Wortman, 1985).

Much of the evidence for the protective value of social support comes from studies of people who were under more severe stresses than those that typically occur at work. For instance, in an early field study, Fritz and Marks (1954) discovered a higher rate of "shocked, stunned or dazed" cases among survivors of natural disasters who were separated from their immediate families. Similarly, Eitinger and Strom (1973) traced a group of Norwegian survivors of Nazi concentration camps and found that those who survived and adjusted to normal life better after they were freed were also the ones who retained close ties with family and sub-cultural groups based on religious and political ideologies.

Chapter 2

In reviewing the literature on social support and serious illness, DiMatteo and Hays (1981) concluded that there is strong evidence to suggest that social connections and relationships are indeed associated with recovery, coping with serious physical injury, and terminal illness. Other studies have also implicated low social support with negative health consequences ranging from mood states (Caspi, Bolger, & Eckenrode, 1987; Solomon, Mikulincer, & Hobfoll, 1986), clinical depression (Broadhead et al 1983), neurosis (Henderson et al, 1981), to mortality (Berkman & Syme, 1979; House, Robbins, & Metzner, 1982; Orth-Gomér & Johnson, 1986; Schoenbach et al, 1986)

Most of these studies tested the protective effects of social support utilizing a "life-events' paradigm and the findings have generally established the benefits of supportive relationships on health. Social support therefore appears to be an important moderating factor in the stress process. Ideas and models similar to those used in life stress research are also applicable and relevant to the study of occupational stress. A considerable number of studies have investigated how interpersonal bonds and supportive relationships may attenuate workplace demands and improve well-being.

Before reviewing the literature on social support in the work setting, it would be helpful to clarify the concept and differentiate between the many typologies of support measures that are currently used.

2.5.2 The Concept of Social Support

The term social support refers to a number of different aspects of social relationships. Its origins appear to have been derived from social network theory (Homans, 1968; Bott, 1971) which proposed that social bonds and positive interaction with others are essential for normal functioning from infancy throughout adulthood. While interpersonal relationships almost certainly serve multiple functions, one of the most relevant categories

for psychology is the provision of support. It is this aspect of the concept that has stimulated most of the recent interest in the field of community health and work stress.

Lin, Simeone, Ensel and Kuo (1979) provide a definition from an essentially sociological perspective, proposing that social support is "*support accessible to an individual through social ties to other individuals, groups, and the larger community*" (p. 109). This approach implicitly specifies that the availability of support resources are dependent on social relationships and affectional bonds, and reflect social network concepts concerning number, frequency, and density of social contacts. These components are similar to what Caplan (1974) regarded as "psychosocial supplies", the essential commodities people obtain from their social networks.

In contrast to this rather vague and very general conception, Sidney Cobb (1976) offered a more focused definition. He proposed three kinds of support, emotional, esteem, and network support, that are important in providing assistance or aid to those under distress. These different aspects of the concept are covered by Weiss (1974), who listed six functions essential for well-being: attachment, social integration, opportunity for nurturance, reassurance of ones's worth, a sense of reliable alliance, and, obtaining guidance, incorporating most of the major elements of current conceptualizations (e.g. Caplan, 1974; Cohen and Mackay, 1984; Hirsch, 1980; House, 1981). However, missing from the list of support functions were material, tangible aids and services (cf. Cohen, Kamarck, Mermelstein and Hoberman, 1985; Schaefer, Coyne and Lazarus, 1982).

Kahn and Antonucci (1980) regard social support somewhat differently defining it as "*interpersonal transactions that include one or more of the following key elements: affect, affirmation, and aid*". Affect is similar to Cobb's esteem and emotional support summed under a single category and refers to *"expressions of liking, admiration, love or respect"*. Affirmation is defined as agreement, acknowledgment of other people's actions and statements, and is akin to Sheldon Cohen's appraisal support. Aid refers to transactions

in which direct assistance is given including money, time, materials, entitlements etc., which Cobb labelled as "material", "active", or "instrumental" support and which Cohen termed "tangible aid". Other writers add to the variety of definitions, differing mainly in their focus of what specific elements constitute social support.

The different views on the meaning of support presented above suggest that, on the whole, there appear to be little agreement over specific definitions although there is considerable consensus about the general nature of the concept concerning the provision of emotional assistance, acknowledgment or appraisal of the individual's experience of distress, and tangible assistance.

An implicit assumption in many of the definitions is the idea that social support is really a two-way, transactional process with both positive as well as negative effects within the milieu of interpersonal exchanges that occur. Thus, while the availability of a large social network provides a potential for beneficial and helpful social interactions, it also offers ample opportunities for social conflict. Paradoxically, most of the empirical evidence has been based on the premise that support is an environmental resource which people draw upon rather than provide, focusing mainly on those who "use" support. There have been little research on the negative aspects of social relationships and the cost of helping others.

2.5.3 The Measurement of Social Support

The wide and diverse range of phenomena within the domain of social support imply that it is indeed a multi-dimensional construct. However, some writers (e.g. Cobb, 1976; Sarason et al, 1983, 1986, 1987) have proposed that only one concept, emotional support, which includes feelings of belonging and attachment), is essential. They suggest that other kinds of support such as material or instrumental help all derive from the central

sense of being loved and cared for. Thus, these components of support are at best, secondary factors.

The variety of definitions and measures of the social support concept have made it extremely difficult to interpret and integrate findings within the research literature. For example, the way social support is defined and measured has been shown to have an effect on the relationships between stress and strain. In a 30-month longitudinal study of an aged sample, Blazer (1982) found social support (assessed in three dimensions) to be a significant risk factor of mortality. However, the magnitude of the relationship between support and mortality depended on the definition of support. Perceived available support was more strongly related to mortality than either support defined as a frequency of interaction with friends and family, or in terms of the availability of roles and attachment (number of living children and siblings, marital status). In another study, Revicki and May (1985) examined the effects of occupational stress and social support on depression among 210 family physicians. They found that support provided by the family (and not by peers) moderated the relationship between occupational stress and depressive symptomatology. The measurement problem is further compounded by studies which have used both structural and functional measures combined in a single index.

A number of investigators have proposed typologies of measures of social support to help provide organization in translating the multi-dimensional concept into operational measures for research. For example, Cohen and his colleagues proposed a distinction between functional and structural support measures (Cohen & Syme, 1985; Cohen & Wills, 1985). Functional support generally describes the helpful functions significant others such as family, co-workers, spouse, and friends perform for the individual in terms of providing emotional, instrumental, and informational aid. Measures of structural support (e.g. *how many friends do you have?*) often assess the nature, number, frequency, density, and characteristics of an individual's network of social contacts.

Chapter 2

House and Kahn (1985) suggested three categories of support measures: social networks, social relationships, and social support. Social network refers to measures that have been derived from formal network theory including network size, multiplicity, density, frequency, and dispersion. Social relationship measures assess the existence, quantity, and quality of existing relationships. Both social network and social relationship measures would be classified as structural measures under the typology proposed by Cohen and his colleagues.

Finally, social support measures assess the type of support resources provided by others, for example, emotional, informational aid, and the quantity and source of these resources (e.g. supervisor, co-workers, friends). Another often used measure which covers the three classifications of measures is social integration, a structural index of social ties that include assessments of marital status, close family and friends, participation in group activities, and church and religious affiliations (Cohen, 1988 ; House, Umberson and Landis, 1988). Most of the studies investigating the role of social support in relation to health use either one of these types of support measures.

With the exception of some poorly constructed scales, most of the well-developed and psychometrically sound measures, e.g. the Inventory of Supportive Behaviours (Barrera, Sandler and Ramsey, 1981), the Interpersonal Support Evaluation List - ISEL (Cohen et al, 1985), the Social Support Questionnaire - SSQ (Sarason et al, 1983), the Social Networks List (Stokes, 1983), do indeed reflect that supportive bonds provide a source of protection against stressful events and crisis. While some investigators have focused on the existence and composition of social relationships by assessing the individual's social network and its pattern of interconectedness among network members, others have concentrated on examining the functional components, for instance, emotional, informational, or tangible aid, in moderating stressful events.

Chapter 2

Perceived versus Structural Measures

It is still unclear which type of measure, structural or functional, is more appropriate and useful in unraveling the processes by which social support operates. Cohen and Wills (1985) reviewed 58 studies of stress and social support and concluded that for support to be effective in offering protection from stress, specific needs e.g. material aid, or emotional assistance, should be matched with the support that is given or elicited. According to their "needs specificity" model, financial help may provide support for someone suffering from say, a temporary job loss but it would obviously not meet the support needs of those confronted with the loss of a family member. The use of structural measures may provide objective data that is less liable to response set bias compared with the use of functional type scales, but such data reveal little qualitative information on the nature and extent of emotional assistance offered in situations where both needs and support "match". The use of functional measures would seem more appropriate when dealing with situations in which the quality and satisfaction of supportive relationships are of primary concern. More recently, in summarizing their conclusions of a meta-analysis of some 80 studies on social support and physical health, Leppin and Schwarzer (1990) noted that the qualitative aspects of social support are considerably more important than quantitative aspects, for example, satisfaction with support showed a stronger impact on health than number of social and personal contacts.

The rationale for using perceived support measures to assess interpersonal resources in the studies reported here follows from the transactional approach that forms the theoretical basis for the present research. The assumption is that the protective effects of social support is primarily mediated by cognitive processes (cf. Lazarus, 1977; Lazarus and Folkman, 1984), that is, support operates by influencing one's appraisal of the stressfulness of one's situation (Cohen and McKay, 1984; House, 1981), the appraisal depending on individual and situational factors.

Chapter 2

Considerable evidence from social psychological experiments show that the presence of other people alters initial perceptions of objective social stimuli (Lazarus, 1966; Tajfel, 1969). Thus, support could have a potentially significant influence on the stress-health chain through any one of the following pathways; potentially stressful events could be appraised as less stressful or even benign if support affected interpretation of the threat posed by the stressor, or if it influenced perceived ability to cope. Consequently, a measure of perceptions of available support would seem to be a more sensitive indication of buffering effects than the existence of that resource. This approach is also consistent with the relational or transactional definition of stress because appraisal of stress is based on the person's beliefs concerning available support rather than it is actual availability.

One question that arises from this theoretical perspective is whether measures of perceived social support accurately reflect indices of the person's existing available resources. It is conceivable that self-report measures may be biased by personality trait factors, an issue discussed earlier under the section on measurement bias. For instance, studies have reported that self-report indices of psychosocial stressors and mental health are highly correlated with trait neuroticism and negative affect (Brief et al, 1988). On the other hand, evidence supporting the validity of perceived measures have been reported by Cutrona (1986), Vinokur, Schul, and Caplan (1987), and Reis (1984). In these studies, the investigators followed their subjects and compared measures of the perceived availability of social support obtained with those reported by the individual's network of social contacts. On the whole, they found a correspondence between the scores obtained from perceived measures and the individual's actual social system.

2.5.4 The Main versus Buffering Effect Hypothesis

The current debate concerning the role of social support in mitigating stress centers around the issue of the mechanisms by which the presence of social relationships characterized by supportive behaviours has an effect on health disorders. One issue is that it is beneficial only for people under stress and this is termed an interaction effect. The other is that it is generally beneficial to all people irrespective of exposure to stress, referred as the main-effect model. The latter model derives from the statistical demonstration of a main effect of support on stress with no stress x support interaction, hence its name. Both main-effect and buffering-effect approaches imply that support is linked to disease or health outcomes through behavioural or biological processes. A schematic representation of the hypothesized main and buffering effects of social support on stress and health outcome is presented in Figure 2.1.

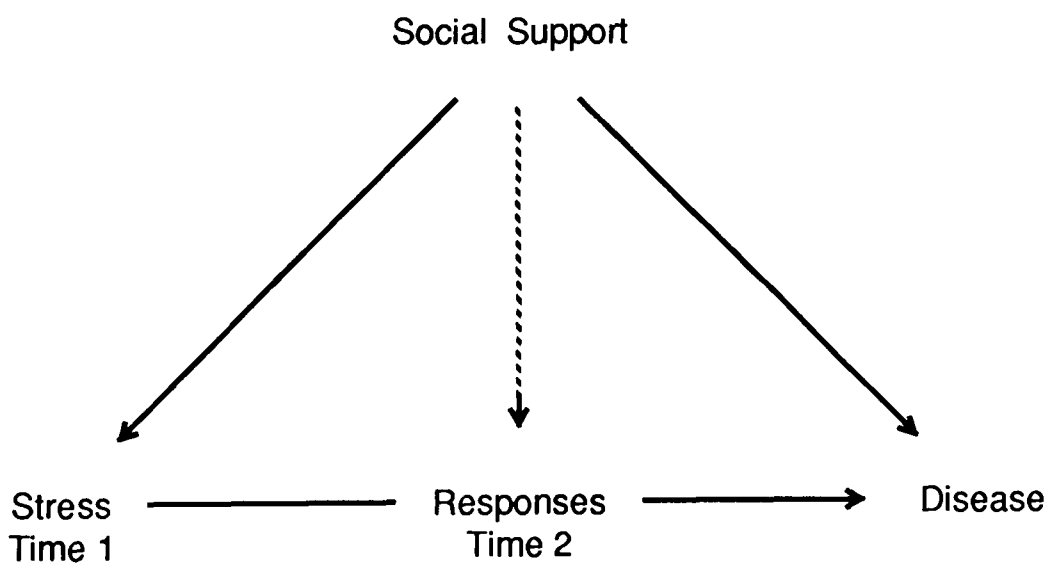

Figure 2.1 Schematic Representation of Main and Buffering Effects of Social Support (Adapted from House, 1981)

The dashed line indicates the interactive effect, the solid lines indicate the main effect. In the main-effect model, interpersonal relationships and social networks are hypothesized to: (i) directly influence the perception and experience of stress; (ii) facilitate general well-being through a variety of health promoting behaviours (solid lines, Figure 2.1). For instance, the knowledge that supportive others can provide the necessary resources to deal with threatening situations may significantly influence the person's appraisal of possible threatening events thus rendering such stressors harmless. Or, persons with strong social networks may generally feel better because networks act as a source of feedback about the person's health and life-style as well as apply social pressure on members to engage in health promoting behaviours.

In the case of the stress-buffering model (dashed line) social support offers protection because it attenuates the aversive effects of stress on health by preventing specific behavioural and biological responses from occurring. This may occur at two different points, Time 1 and Time 2. Social support may intervene between the time the person encounters the stressor and the stress reaction (Time 1) by attenuating or preventing a stress appraisal response. In other words, the perception of available support resources may redefine the potential threat or harm posed by the situation and as a result, bolster the person's perceived ability to cope with the problem. This may render a highly demanding situation less stressful. Secondly, support may intervene at Time 2 between the experience of stress and the onset of disease by directly influencing affective responses, by altering maladaptive behaviours, or by directly dampening physiological processes. A full discussion of the mechanisms and processes of psychosocial models and social support is presented in a recent review of social support research by Cohen (1988).

Figure 2.2.1, Figure 2.2.2 and Figure 2.2.3 present purely theoretical data predicted by the main-effect model and the stress-buffering model (Cohen and Wills, 1985). A "pure" buffering effect is evident when support is seen to totally ameliorate the influence of stress on health outcomes (Figure 2.2.3). A more moderate version of the stress-

Chapter 2

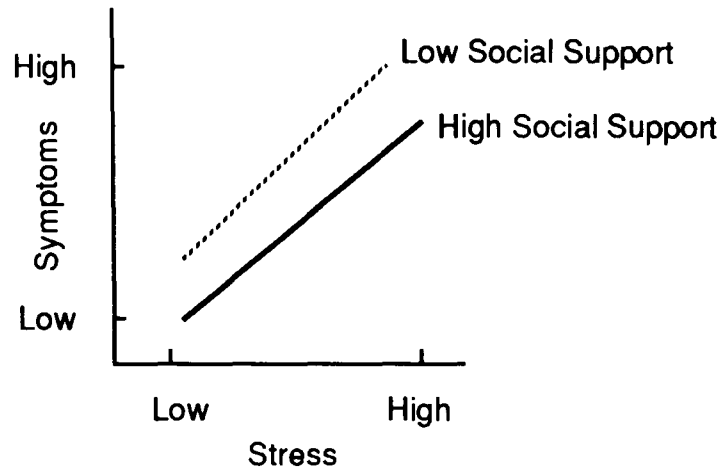

Figure 2.2.1
Main Effect Model

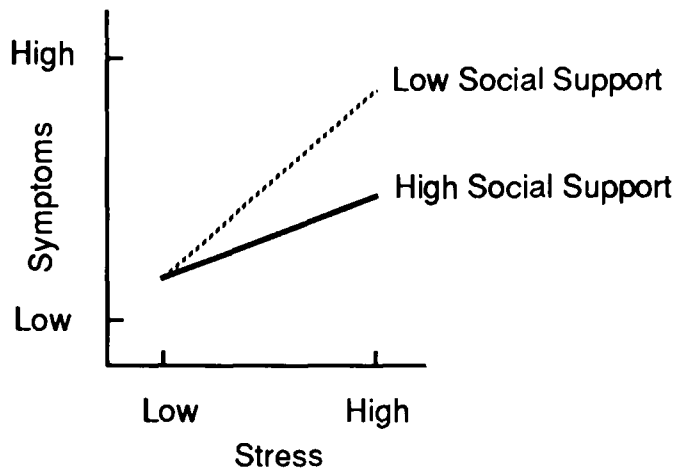

Figure 2.2.2
Buffering Effect Model.

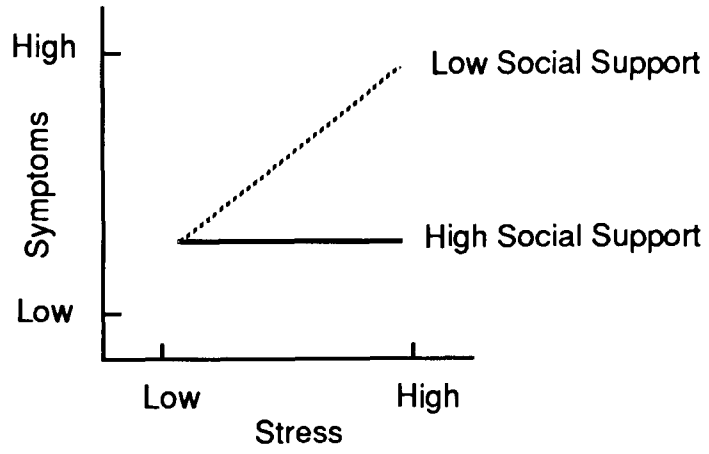

Figure 2.2.3
"Pure" Buffering Effect

buffering hypothesis suggests that support attenuates stress to some extent but does not offer total protection (Figure 2.2.2). This form of the interaction is more often found in the literature. The ("stress" x support resource) interaction term represents the index of the difference between the slope of the stress-symptom relationship for persons high on the resource and the slope of the stress-symptom relationship for persons low on the resource. Detailed expositions on statistical procedures for assessing main and interactive effects can be found in Cohen and Cohen (1983), or Pedhazur (1982).

2.5.5 Evidence for Main and Buffering Effect Models of Social Support

Several studies have reported significant interactions of job demands and social support in relation to a variety of psychological and physical health outcomes (House and Wells, 1978; House, 1981; Etzion, 1984; LaRocco, House and French, 1980; Seers et al, 1983; Russel, Altmaier and Van Velzen, 1987). Wells (1982) surveyed a sample of 1830 factory workers and assessed perceived availability of support from supervisors, co-workers, spouse, and family-friends. Job demands were conceptualized in terms of responsibilities for people and machinery, concern for quality, role conflict, workload and feelings concerning work interfering with family and personal life. An objective measure of job conditions was constructed from company records, e.g. job descriptions and ratings made by a panel of expert raters. The results showed that social support moderated the relationship between job conditions and five of the nine indicators of perceived stress. This was interpreted as a buffering effect in which social support, particularly support from supervisor, significantly altered perceptions of stressful job conditions.

Similar findings were reported by Winnubst, Marceliessen and Kleber (1982) in an investigation of the moderating effects of social support on job stress among a Dutch sample. Their data revealed that social support to be negatively correlated with job stressors, psychological strains, and heart and somatic complaints. Evidence for the conditioning effects of social support was also demonstrated for psychological, behavioural strains and blood pressure.

Another line of evidence for the stress-buffering hypothesis comes from a study reported by Karasek, Triantis and Chaudhry (1982) in which they tested whether co-worker and supervisor support moderated the stress-strain relationship (cf. La Rocco and Jones, 1978). Using data drawn from a U.S. national survey, they performed multiple analyses on their data in order to test their hypothesized stress-buffering and "stress-transfer" model of social support. Their findings provide strong support for the interactive model. They

interpreted the overall results in terms of a "stress-transfer" and "negative-buffering" form of social support, suggesting that the level of protection accorded the individual by the (work) group partly depended on the overall stress levels of the group itself. The model predicted that individuals would benefit less from their surrounding social networks during periods of group crisis, when stress is high.

However, other studies have failed to find buffering effects (Pinneau, 1976; Gavin and Axelrod, 1977; Blau, 1981; Billings and Moos, 1982). La Rocco and Jones (1978) studied a large sample (n=3725) of Navy enlisted men aboard twenty ships obtaining separate measures of leader and co-worker support, perceived job strains and stress, and physical illness based on number of visits to the infirmary over an eight month period. There was a main effect for psychological health outcome (e.g. job satisfaction) but not for physical illness or self-esteem. Furthermore, the work support measures showed a main effect only for job-related outcomes but not for health-related outcomes. One possible reason for these negative findings may be the different types of measures used, or the design of the research, which were not sufficiently sensitive in detecting buffering effects (Cohen and Wills, 1985, Payne, 1980).

More recently, in a study specially designed to address the main versus buffering effect controversy, Fusilier, Ganster, and Mayes (1986) obtained measures of supervisor, co-worker and friend-family support, job stress, strain and psychological health outcomes from a sample of 326 employees spanning a range of white and blue collar jobs. Job stress was operationalised in terms of role ambiguity, role conflict, quantitative workload, skill-underutilization, lack of variability in the job, and responsibility for others. Statistical analyses were performed to test for main and interactive effects of social support on relationships between strain outcomes and job stressors. Tests for higher order interactions were also performed involving social support, job stressors, personality factors, and

symptom measures. The data revealed a main effect but there was no evidence of a buffering effect for social support on stress and health.

Comment

An inordinate amount of effort has been directed toward establishing the main or buffering effect model of social support in the past decade or so. The controversy, however, remains largely unresolved as a result of the conflicting evidence. Opinion is divided, even among the specialists in the field. Cohen and Wills (1985), for instance, concluded that *"the literature on occupational stress does not provide considerable support for the buffering model"* (p. 347). On the other hand, Ganster and Victor (1988) noted that even in studies in which buffering effects were reported, they were not always consistent across different types of stressors, outcome variables and measures of social support. They suggested that the buffering hypothesis *"does not receive very strong confirmation in the occupational stress literature, even though perceived functional measures of support are virtually the only ones used"* (p. 28).

Part of the problem in integrating the research is a result of methodological shortcomings in research designs and the numerous and different measures of social support. Cohen and Wills offers a possible explanation that may reconcile the differences of opinion concerning the role of social support as a stress buffer. In evaluating some 40 articles comparing the main-effect and the stress-buffering models, they noted that structural measures of support were generally associated with main effects while functional measures were more frequently associated with stress-buffering or interactive effects. Thus, support for each model depended on the nature of the social support or network measure used. Taken as a whole, it is possible that social support has both a main and an interactive impact and neither possibility should be dismissed.

2.5.6 Social Support and Individual Differences

While it is undoubtedly correct that how much support a person has depends partly on what the social environment provides, it is equally important to evaluate what contributions individuals themselves make to their own support networks. This aspect of the problem has received relatively little attention although a number of writers have raised the question that the protective effects of social support might possibly be due to differences in social competence and personality factors (Heller and Swindle, 1983; Duckitt, 1984; Lefcourt, 1985). They argued that socially competent people, extraverts and those with internal locus of control, are more able to attract social support and also more able to cope with stressful events.

Sandler and Lakey (1982) reported that among individuals high in locus of control (internals), those who had greater access to social support showed lower incidence of anxiety and depression than did those who had less access to social support. In contrast, externals showed minimal variation in the relationship between stress and dysphoria as a function of support. Lefcourt (1985) extended this line of research and in an experimental investigation of the relationship between locus of control and belongingness, concluded that internals appeared to need more support than externals, benefiting more from its presence and suffering more from its absence.

The possibility that support measures may merely be proxies for social skills or competence is of immediate concern because if personality factors and not social support protects people from the pathogenic effects of stress, then, from the point of public health, the use of social support interventions would be fruitless. The significance of the problem was clearly emphasized by Heller (1979; Heller and Swindle, 1983) when they suggested that the stress-buffering effects of social support may be attributable to greater social competence among people with higher levels of social support.

Chapter 2

Sarason, Sarason, Hacker and Basham (1985) demonstrated that social skills and social support are indeed related. They found significant differences in subjects' knowledge of what types of social behaviour constitute social competence between high and low social support groups. Although this study does not enable further conclusions to be drawn concerning whether knowledge about one's social competence would lead to active efforts in improving such skills where deficient, the results do show that further research is needed in establishing the causal relations between social skills and social support. In examining such a relationship. Cohen, Sherrod and Clark (1986) reported that the stress-buffering effect of perceived availability of support was unaffected by controls for the possible influences of social anxiety, social competence, and self-disclosure.

Research on loneliness provides another line of evidence indicating that personality correlates may be linked to feelings of isolation, and by implication, patterns of interpersonal behaviour and social support (Jones, 1982; Jones, Sansone and Helm, 1983). Taken together, these studies suggest that lonely persons do not lack opportunities for social interaction. On the contrary, lonely persons in fact reported that they had a greater diversity of social contacts although they strongly believed that they had less contact with other people than those who were not lonely. One interpretation is that such experienced feelings of loneliness in particular, and of social support in general, are located within the individual's interpretive framework rather than the social environment.

Sarason, Sarason, and Shearin (1986) demonstrated the developmental links between social support, parental attachment and patterns of social embeddedness among a small sample of male and female college freshmen. Analysis of their data revealed that perceived availability of social support levels were stable over a three year period. Their conclusions suggested the potential advantages of considering social support as an individual difference variable as a buffer against stress. In another recent study, Caldwell and Reinhart (1988) found significant relationships between disposition measures of trait

anxiety, social anxiety, self-esteem, and emotional support. Different sources of support were helpful in different ways. That is, anxious individuals who anticipated negative evaluation from their social networks seemed to mobilize informational and guidance types of support whereas those with a secure self-concept (high esteem) tended to elicit and receive more emotional support. Their findings reinforce the arguments made by Sarason and his colleagues in calling for researchers to broaden the scope of future investigations to include personality dimensions in studying the impact of social relationships as vulnerability factor in stress.

Lastly, perhaps the strongest argument for extending the socio-environmental approach to include individual differences comes from the work of Henderson, Byrne, and Duncan-Jones (1981). They found that indices of availability of social relationships and networks made negligible contributions explanations of mental health outcomes when personality and background factors were held constant. In their analysis, trait neuroticism accounted for 69% of the explained variance in psychological wel-being, consequently dominating any regression equation relating background and personality factors to psychological outcome. This finding suggests that researchers should be cautious in drawing conclusions regarding the buffering effects of support resources on stress and health.

Comment

The idea that interpersonal relationships may mitigate health-related responses to stressful events has important implications for the social support buffering hypothesis. By studying the effective ingredients of helpful relationships, researchers can clarify the manner by which social support operates. This could be of great value in explicating helping behaviour. The studies reviewed point to some potentially interesting and worthwhile areas of study for future research.

First, they demonstrate that there are significant differences in people's need to feel the comforting presence of supportive others in times of crises. Extraverts, socially competent people and internal-external locus of control individuals differ in how they draw upon sources of available assistance and in the benefits they derive from such supportive relationships. The research reported by Sandler and Lakey (1982) and Lefcourt (1985) illustrate this. In as much as opportunities are open for people to interact socially and develop supportive relationships from which they may benefit, personality attributes can modify the experience and outcome of social interactions. Neuroticism, extraversion, and locus of control have been found to be correlated with measures of emotional, belonging, esteem, and tangible aid. However, the multiplicative effects of these traits on perceived support is not known. Furthermore, the empirical evidence strongly suggests that locus of control may play a significant role in modifying perceptions of social support.

Second, many writers have emphasized the need to broaden the scope of the theoretical framework to include personality factors within current research paradigms. This derives from transactional approaches which hypothesize that appraisal processes are causally linked to personality dispositions like trait anxiety and personal control beliefs. Thus, the inclusion of individual difference variables is particularly relevant in the case of perceived measures of social support because such measures are based on the premise that the individual's perception (or belief) of support resources available is more important than the actual support that may be present. Any findings concerning the role of perceived social support as stress buffers would therefore need to also consider the possible influence of individual differences in the perception process.

2.6 Overview and Aims of Present Research

Taken as a whole, the studies described in this review indicate that demands arising from job and organizational factors can have adverse effects on physical and mental well-being, and that personality and situational factors moderate the stress-illness link. The research has also shown that the relationships between these variables are highly complex. In seeking to clarify the nature of these complex relationships, researchers have developed interactive models which specify the conditions under which a combination of variables (e.g. work demands, personality and social resources) may interact to jointly influence the experience of stress and stress-related responses.

Although a number of work environment stressors have been correlated with ill-health, perhaps the two most important variables that are important when considering the structural characteristics of work are job demands and job autonomy or control. These ideas were synthesized by Robert Karasek to form the basis of his interactive demand-control theory. In reviewing models of work stress, demand-control theory has demonstrated that specific characteristics of work are associated with strain and adverse health outcomes. From a public health viewpoint, demand-control theory is, therefore, better able to clarify the relation surrounding the complexity of work tasks and job factors on health than either role-stress theory or P-E fit theory since under this approach the emphasis is on workplace constraints rather than limiting factors within the individual. The model has demonstrated a combination of high psychological demands and low job discretion, global structural characteristics, is particularly deleterious, but have not identified the specific stressors associated with these global factors. The question also arises as to whether the model has been adequately tested on small, homogeneous samples and if the conflicting findings reported in the literature are actually a result of differences between occupational groups.

There is also considerable evidence to indicate that psychosocial resources act as stress moderators. While research in this area has generally been quite successful in revealing how affiliative bonds and supportive relationships mitigate stress, there are some issues which require further investigation. For instance, relatively few studies have explored individual differences in social support, or the relation between personality characteristics and social support as stress moderators. Although this brief literature review can only permit tentative conclusions to be drawn, it appears that there are further interactive relationships between the moderator variables locus of control and Type A behaviour, which may in turn influence social support in ameliorating the adverse effects of work demands on mental and physical well-being.

The premise underlying the support measures used in the studies reported in this thesis is based on the theory that social support is cognitively mediated, similar to the appraisal model of stress (Lazarus and Folkman, 1984; House, 1974, 1981) discussed earlier. Thus, potentially stressful events and other forms of stressors appear less stressful to the individual when he perceives that there are sources of assistance available in helping him to cope and deal with the situation at hand. Since the focus is on the notion of appraisal, the resources actually available may not be as important as thought. It would seem reasonable to assume that a link exists between perceived available support and the individual's belief regarding the extent to which they can influence the outcome of interpersonal relationships.

Purpose of the Present Research

The purpose of the present thesis is to examine the relations among certain specific work environment factors, individual differences, and social support in order to determine the additive and interactive effects of these variables on mental well-being. In addition, the Karasek theory appears to be of relevance since it is one of the more concise and

parsimonious formulations of how work characteristics can affect stress responses. A second important aspect of the work was to evaluate the Johnson and Hall (1987) demand-control-support model of work stress in predicting psychological well-being since evidence for the 3-dimensional theory has come mainly from a large scale Swedish study which investigated cardiovascular disease as outcome. In the light of research findings discussed above, the specific objectives of the present work are outlined below:

(i) To investigate the relations between certain personality factors and perceived social support.

(ii) To investigate the relation between certain personality dispositions and psychological well-being.

(iii) To examine the main and moderating effects of social support in moderating work-related stressors in relation to job satisfaction and psychological health.

(iv) To test the demand-control model of work stress developed by Karasek and the three-dimensional demand-control-support stress model developed by Johnson and Hall.

The conceptual framework underlying the field studies (reported in Chapter 4 and Chapter 5) is based on the House model (Chapter 1). This model is adopted because it provides an overall perspective of the important issues concerning work stress research. Whilst the Karasek demand-control theory and Johnson's demand-control-support theory are highly specific in their emphasis and conception, the major dimensions of these two interactive models of work stress are also represented in the House model.

Chapter Three

Present Studies: An Overview of Psychometric Characteristics of Work, Personality and Mental Health Measures

Summary

The purpose of this chapter is to bring together an overview of the psychometric characteristics of the scales used in the field studies described in Chapter 4 and 5. The main work situation variables that were assessed included perceived job demand, job decision latitude, and social support. The outcome measures were work satisfaction and psychological well-being. In addition, the personality dispositions of trait extraversion, neuroticism, need achievement, and locus of control were measured. Two methods of factor analysis, principal axis factoring and the Very Simple Structure (VSS) technique, were used to examine the underlying structure of the Eysenck Personality Questionnaire and the Paulhus Spheres of Control scales. The dimensional structure of the Work Preferences Questionnaire was also investigated. The results of the analyses generally provided confirmation of the dimensionality of the scales tested. In the case of the Paulhus SOC scale, the factor solutions were less clear. One or two orthogonal factors could be extracted, depending on the method of factor analysis used.

Chapter 3

3.1 Assessment of Variables

The purpose of this chapter is two-fold. First, the aim is to describe the questionnaire measures used in the studies reported in Chapter 4 and 5, and second, the aim is to discuss results from statistical analyses carried out to examine the factor structure of the personality trait measures. A summary of the alpha coefficients of all the measures of work, personality and mental health measures is given in the results section (Table 3.4). For complete listings of the questionnaire measures and detailed results of the psychometric analyses, see the Appendices.

3.1.1 The Work Environment

Psychological Job Demand

Buck (1972) has pointed out that when a wide variety of potential sources of stressors are reviewed, the demands related to accomplishing the task are the most commonly cited source of job pressure. "Job demands" were therefore assessed by means of the Karasek Work Questionnaire (1979). This questionnaire consists of seven items and measures psychological stressors such as workload and time pressures concerning work. Acceptable alpha coefficient values for this scale have been reported e.g. $\alpha = 0.77$ (Parkes, 1982). The subjects in the present studies are mainly white-collar workers. Physical job demands are therefore not of major relevance and were not assessed.

Job Decision Latitude

Job decision latitude, or job discretion, refers to *"the working individual's potential control over his tasks and his conduct during the working day"* (Karasek, p. 289-290; 1979). Work control was assessed by means of the eight-item Karasek measure which comprises four items relating to skill discretion and four items relating to decision authority. Karasek reported an alpha value of 0.82 (Cronbach's reliability coefficient) for the eight-item job discretion scale.

Likert-type response formats using a four-point scale were used with both measures. Two indices were constructed, one each for psychological job demands and job discretion, by summing scores across the scale items. Both the psychological job demands and job decision latitude measures have been widely used and tested in research on work stress (e.g. Karasek, Gardell and Lindell, 1987; Karasek et al, 1988; Johnson and Hall, 1988) while several other studies have employed modified shortened versions of the original questionnaire. The complete 15-item questionnaire was used in the present research. A full version of the questionnaire is given in Appendix 2 and 3.

Validity studies which investigated the factor structure of the Karasek Work Questionnaire provide evidence for the conceptual distinction between work demands and work control (Karasek, 1979). In addition, results from factor analyses reported by Karasek indicate that items from the "skill discretion" and "decision-authority" components of the job discretion scale load clearly on a single dimension. Other studies using similar measures of "skill discretion" and "decision-authority" reported that these two components are highly correlated, in the range r = 0.55 to 0.60 (Gardell; Kohn and Schooler, 1973; Hackman and Lawler, 1971).

Social Support

(i) Work-Related Support

A modified version of the House (1981) measure of perceived availability of work support was used to assess supportive relationships relating to work problems from four sources: immediate supervisor(s) or boss, work colleagues, spouse or partner, and, friends and relatives. Four indices of work support indicating amount of supervisor, co-worker, spouse/partner, and friends/relatives support were calculated by summing the responses to the appropriate items from each support source. Because the emphasis of the study was on the specific sources of support in moderating job stress the scores were not combined into a single measure. The House scale primarily measures emotional support although other

investigators have adapted it to assess tangible and instrumental aid (e.g. Ganster, Fusilier and Mayes, 1986; Kaufmann and Beehr, 1989). Kaufmann and Beehr reported scale reliability coefficients from 0.71 to 0.88 (Cronbach's alpha) for a modified version of the House work support scale used in a study of occupational stress among police officers.

(ii) Global Support

Global social support was assessed using the general population form of the Interpersonal Support Evaluation List (ISEL) developed by Cohen and his colleagues (1985). The ISEL consists of a list of 40 statements concerning the perceived availability of potential support resources and measures four support functions a person's social network might provide: appraisal support measures the perceived availability of someone to talk to about one's problems; belonging support, the perceived availability of people one can do things with; tangible support measures the perceived availability of material or instrumental aid; and esteem support measures the perceived availability of a positive comparison when comparing one's self with others. The items are counterbalanced for social desirability, that is, half the items are positive statements about social relationships (e.g. *"There is at least one person I know whose advice I really trust"*) and half are negative statements (e.g. *"There are very few people I trust to help solve my problems"*). Respondents indicate whether each statement is probably true or false of themselves. The ISEL is scored by counting the number of responses indicating support for each of the four subscales. An overall index of social relationships is calculated by summing the support scores across the four subscales.

The esteem support subscale of the ISEL was dropped from the present study as the content of the items appeared to overlap with those in the appraisal and belonging subscales. In addition, it was important to keep the questionnaire to a reasonable length.

Chapter 3

In a series of validation studies, Cohen, Kamarck, Mermelstein and Hoberman (1985) reported internal reliabilities ranging from 0.88 (α coefficient) to 0.90 for the total general population form of the ISEL. Adequate test-rest correlations over a six week interval were also found for the overall ISEL (0.70) and for all the four subscales. The overall ISEL correlated 0.30 with the total score of the Moos Family Environment Scale (Moos and Moos, 1981) which assesses the amount of perceived support family members provide for each other. The ISEL was also found to be significantly correlated with number of close friends ($r = 0.46$) and number of close relatives ($r = 0.42$) but was not correlated with the Crown-Marlowe measure of social desirability. Other studies have also reported evidence for the validity of the ISEL. Sarason, Shearin, Pierce and Sarason (1987) investigated three different conceptions and measures of perceived availability of social support, the Social Support Questionnaire (Sarason, Levine, Basham and Sarason, 1983), the Perceived Social Support scale (Procidano and Heller, 1983), and the ISEL. Their results showed that the three scales were highly intercorrelated suggesting that the three instruments measure much the same construct.

The ISEL has been widely used to assess perceived social support in studies which investigated support interventions and smoking behaviour (Baer, 1987; Cohen et al 1988; Mermelstein et al, 1986), and the stress buffering effects of social relationships on psychological health (Cohen, Sherrod and Clark, 1986; Roos and Cohen, 1987). However, very few studies have been reported in which the ISEL was used to assess social support in work stress research. The alpha coefficients for the reliability of the ISEL subscales for the present sample are 0.87 (total ISEL score), 0.77 (appraisal support), 0.82 (belonging support) and 0.69 (tangible support).

3.1.2 Individual Differences

The Eysenck Personality Questionnaire

The Eysenck Personality Questionnaire (EPQ) (Eysenck and Eysenck, 1975) assesses the personality dimensions of extraversion, neuroticism and psychoticism.

A short version of the revised EPQ (Eysenck et al, 1985) was used to assess extraversion and neuroticism. Each subscale consisted of 12 items. The psychoticism subscale was omitted because this construct was not relevant to the aims of the present research. Published data on the reliabilities of the 12-item extraversion and neuroticism scales show α values (Cronbach's coefficient) of 0.88 and 0.84 respectively. Principal component analysis of the EPQ has generally provided good support for the three-dimensional factor structure of the EPQ (Eysenck and Eysenck, 1975; Eysenck, Eysenck and Barret, 1985).

Locus of Control

Locus of control beliefs were measured by means of the 30-item Paulhus Spheres of Control (SOC) scale which assesses perceived control in three behavioural domains: (1) personal efficacy, which represents control over the non-social environment; (2) interpersonal control which applies in dyadic or group situations; (3) socio-political control which refers to personal beliefs about influence over political and social systems (Paulhus and Christie, 1981; Paulhus, 1983). However, the socio-political items were omitted because the focus of the research was concerned primarily with the individual and his or her work group. Paulhus (1983) reported alpha reliabilities for all three subscales ranging from 0.75 to 0.80; test-retest correlations at four weeks were above 0.90 and at six months, above 0.70. A number of studies have used the SOC inventory (e.g. Davies and Kirby, 1985; Rosen, Tomarelli, Kidda and Medvin, 1986). More recently, evidence for the three-dimensional factor structure of the SOC model has been reported by Parkes (1988).

Work Preferences

Preferences for particular types of work and task characteristics were assessed using a modified form of a questionnaire devised by Parkes (personal communication, 1986).

The Work Preferences Questionnaire (WPQ) contained 26 statements describing specific types of job attributes relating to work tasks and activities, the social working environment and opportunities for challenge, achievement and motivation (e.g. *"A predictable work routine"*, *"Friendly, congenial work colleagues"*, *"Opportunities for achievement"*). The questionnaire was administered twice, with separate instructions given for each assessment. In the initial assessment, subjects were asked to respond as if they were describing their "ideal" job. In the second assessment, the instructions stated that subjects should indicate the extent to which the items in the questionnaire reflected their current work situation.

There are two factors underlying the dimensional structure of the WPQ. The first dimension describes characteristics of the job that are associated with intrinsic motivators such as status, esteem, opportunities for challenge, achievement, and social interaction; the second dimension reflects extrinsic work factors that include hours of working and the surrounding physical work environment (see Section 3.3). These factors correspond approximately to those of Herzberg's two-factor theory of work motivation (Herzberg, Mausner and Snyderman, (1959).

3.1.3 Outcome Measures

Mental Health: The General Health Questionnaire

The General Health Questionnaire (GHQ) was developed by David Goldberg (1972) as a self-administered questionnaire designed to detect minor psychiatric disorders among respondents in community settings, and as a method for estimating an individual's level of psychiatric disturbance. The set of items in the GHQ are concerned with two major classes of mental health: impaired psychological functioning, and the appearance of new phenomena of a distressing nature. Two main scoring methods are used: (i) a dichotomous scoring scheme (the GHQ method) in which the first two response categories are scored as "0" and the third and fourth categories are scored as "1"; (ii) a Likert-method where responses are assigned weights of "0", "1", "2", or "3". Details of the development and psychometric properties of the scale are fully described in Goldberg's monograph (Goldberg, 1972).

The original version consisted of 60 items which were subsequently reduced to the "best" 30, 20 and 12 items (GHQ-30, GHQ-20, GHQ-12) for use where respondents' time is at a premium. All versions of the scale were reported to be highly correlated with one another. Empirical studies that investigated the GHQ (summarized in Goldberg, 1978) have generally provided evidence for the validity of the scale. The GHQ has been reported to be sufficiently sensitive and specific in discriminating between "cases" and "normals" and the correlation of the scale with independent clinical assessments are typically $r = 0.70$ or greater.

The GHQ-12 was well-suited to the requirements of the present research because of its short length. Furthermore, the scale has been tested in occupational settings and has been shown to be psychometrically sound (Banks et al, 1980). The Likert-method of scoring was adopted since validation studies by Banks and his colleagues have shown that this method produces scores which are consistently less skewed and closer to a normal

distribution than the GHQ method. In addition, the seven-item social dysfunction subscale was included in the longitudinal study of a group of Oxford graduates (Chapter 5). The social dysfunction measure reflects feelings of social inadequacy, indifference, low morale and lack of interest, potentially of particular relevance to this group.

The GHQ has been used in a number of studies of occupational stress and mental health (Liff, 1981; Miles, Howard and Henwood, 1984; Wall and Clegg, 1981) and in longitudinal studies of unemployment (Hobbs et al, 1985; Jackson, et al, 1983; Payne, 1988). The alpha coefficient for the GHQ scale was in the range 0.83 to 0.86 (see Table 3.4), consistent with the Banks et al study, and other work (e.g. Parkes, 1989). It is important to emphasize that in these studies, the GHQ was used not for case identification but for comparing levels of psychiatric illness within and between populations.

Work Satisfaction

A three-item measure of work satisfaction was constructed. The items asked respondents how satisfied they were with their present job, how much they enjoyed their work in the past six weeks, and how often they felt fed-up with their job. Likert-type scoring was used in assessing responses. A single index of job satisfaction was obtained by summing the scores from the three items (the "negatively" worded statement "*fed-up with job*" was reverse scored so that the higher scores represented greater job satisfaction. The mean alpha reliability for the three-item total job satisfaction index was 0.88.

3.2 Statistical Analysis

Although measures of work, personality traits, and health outcomes reported in the literature possess adequate psychometric properties, there are controversies surrounding the dimensional structure of some widely used scales. For instance, factor-analytic investigations of the Rotter Locus of Control Scale (Rotter, 1966), originally conceived as a unidimensional measure of generalized expectancies concerning internal versus external control of reinforcements, have reported from two to nine subscales for the measure. Some investigators have identified five-factor solutions (Garza and Widlak, 1977; Schneider and Parsons, 1970) while others have reported as many as nine dimensions (McInish and Srivastava, 1982). In the light of these controversies, the personality questionnaire measures in the present studies were examined in relation to their underlying factor structure. The purpose of the analyses was to determine whether the number of dimensions corresponded to their theoretical conception.

Several factor analytic procedures as well as criteria for determining the number of components to retain in factor analysis are available. Criteria used to determine the optimum number of factors to extract include Cattell's scree test (Cattell, 1966), the "eigenvalues greater than one" rule (Kaiser, 1960), and the Minimum Average Partial test, (Velicer, 1976). More recently, the Very Simple Structure analysis (VSS) has been shown to be a potentially useful alternative method of mapping out the dimensional structure of a particular set of items or variables (Revelle and Rocklin, 1979). Exploratory factor analysis and the VSS method were used in order to verify the underlying factor structure of the questionnaire measures of Locus of Control and the Eysenck Personality Questionnaire.

(i) Iterated Principal Components Analysis

First, the data were analyzed using iterated principal components (or principal axis) analysis. This procedure extracts the principal factors from a correlation matrix with

communality[1] estimates, h^2 , along the diagonals, and factors the variance associated with the common factors. Other approaches e.g. principal components maximize the total communality (1's along the diagonals) of the variables. While some researchers consider maximizing the total communality a more attractive approach, some initial estimates of the communalities must be obtained prior to the analysis. One advantage of iterated factor extraction is that various procedures for estimating initial communalities are available in the major statistical packages. Using the principal axis method, factor solutions from one to five factors were derived. The initial factors extracted were varimax rotated in order to facilitate the interpretation of the common factors.

(ii) Very Simple Structure Analysis

An alternative exploratory method for estimating the number of interpretable factors was then applied to the data set. The technique used was Revelle and Rocklin's (1979) Very Simple Structure (VSS) analysis. Simple structure can be used as a rotation criterion to provide a meaningful solution to the problem of the indeterminacy of the factors. According to this approach, the proper number of factors are those factors that maximize "simple structure". Thus, the VSS technique imposes a simple structure on a factor pattern matrix and then re-creates the original correlation matrix. The extent to which the reduced (simple) structure matrix corresponds to the initial correlation matrix is indicated by the VSS index, a criterion of the goodness-of -fit (values from zero to one), a maximum value indicating the optimum factor solution for any particular data set. Revelle and Rocklin have demonstrated that the VSS method is consistently more accurate than other approaches in revealing the true number of factors in artificial data sets as well as in empirical data (Revelle and Rocklin, 1979). More recently, the advantages of this quantitative approach in clarifying inconclusive results obtained from the application of

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1. Communality refers to the variance of an observed variable accounted for by the common factors; in orthogonal models, it is equivalent to the sum of the squared factor loadings (Kim & Mueller, 1978).

more conventional psychometric "rule of thumb" procedures has been demonstrated by Parkes (1985).

3.3 Results

(i) Eysenck Personality Questionnaire (EPQ)

The successive eigenvalues[2] for the first five factors extracted by principal axis factoring were 4.97, 2.92, 1.2, 0.80 and 0.68 for the entrepreneur data set (Study 1), and 4.28, 2.50, 1.15, 0.90, and 0.58 for the Oxford graduates sample (Study 2). Inspection of the eigenvalue plots indicated that the "scree" occurred at about the second or third factor. No objective scree test (Gorsuch and Nelson, 1981), however, was applied to the data. Since only two subscales of the EPQ were used in the present study, the two-factor solution appeared more appropriate. This interpretation was based on the results from the rotated factor matrix pattern. Each of the 12 items for the neuroticism and extraversion subscales loaded clearly on Factor 1 and Factor 2 for both data sets.

Summary statistics produced by the VSS analyses indicate the rank of items in relation to the number of factors extracted. Higher rank solutions produce better goodness-of-fit-index values, and Rank 1 solutions are therefore used as the criteria for interpreting the optimal number of factors underlying the factor structure of the scale (unless otherwise stated).

Results from the VSS analysis showed a maximum goodness-of-fit index at 0.701 and 0.744 for the two-factor solution for Study 1 and Study 2 respectively. Each of the 24 item loaded clearly on either one or the other factor. Thereafter, the goodness-of-fit index decreased as the number of factors increased. Table 3.1(a) and 3.1(b) gives a summary of the VSS analyses.

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2. Eigenvalue refers to the amount of variance accounted for by each factor.

Chapter 3

Table 3.1 (a) Summary Statistics for VSS Analyses (Study 1, N=117)
Eysenck Personality Questionnaire

Number of	Rank of Items				
Factors	1	2	3	4	5
1	0.634				
2	**0.701**	0.844			
3	0.561	0.806	0.867		
4	0.342	0.726	0.841	0.866	
5	0.374	0.710	0.822	0.860	0.860

VSS goodness of fit index for Rank 1 solutions reaches a maximum (of **0.701**) when 2 factors are extracted.

Table 3.1 (b) Summary Statistics for VSS Analyses (Study 2, N=121)
Eysenck Personality Questionnaire

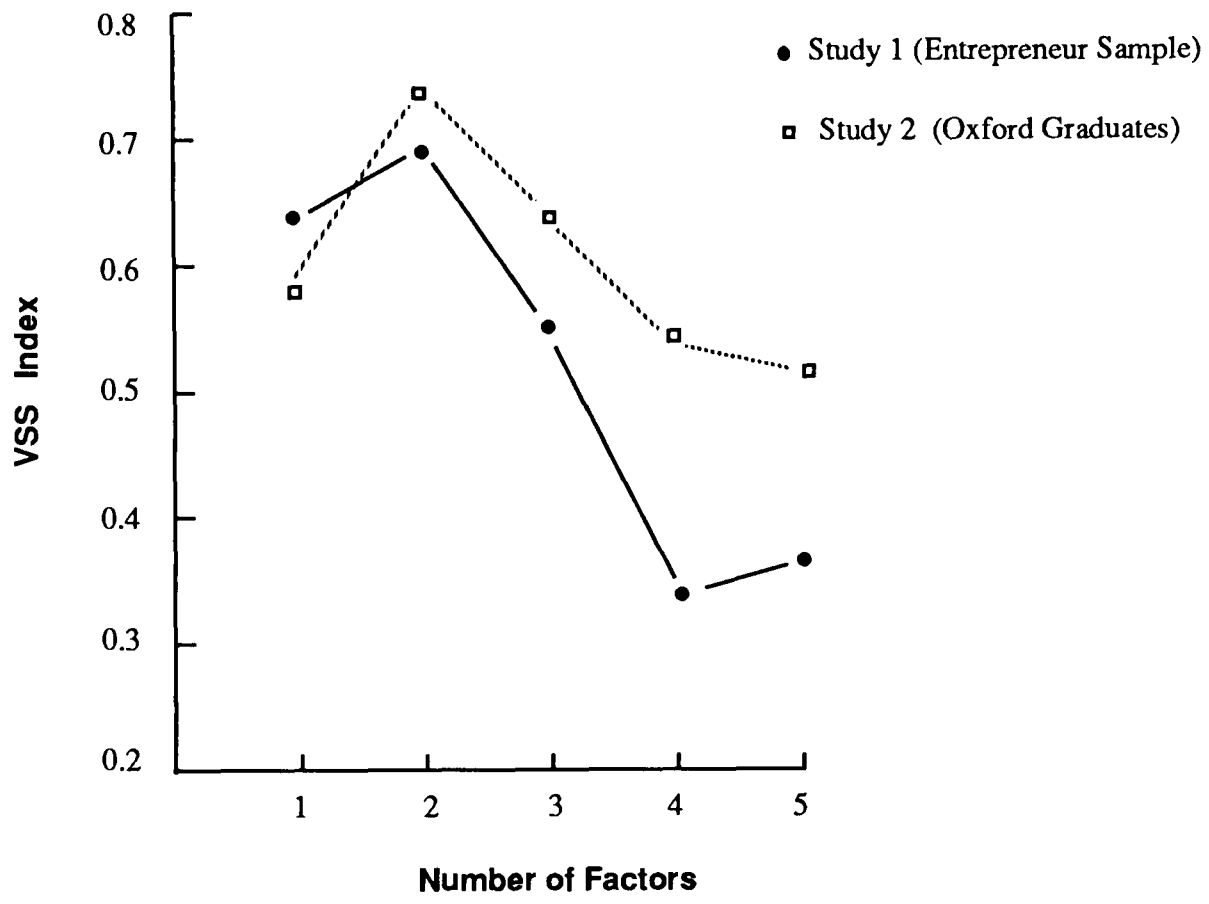
Number of	Rank of Items				
Factors	1	2	3	4	5
1	0.611				
2	**0.744**	0.846			
3	0.637	0.857	0.886		
4	0.537	0.825	0.887	0.910	
5	0.522	0.783	0.877	0.908	0.918

VSS goodness of fit index for Rank 1 solutions reaches a maximum (of **0.744**) when 2 factors are extracted.

A graphical representation of the relation between the VSS index and the number of factors extracted for the EPQ in Study 1 and Study 2 is shown in Figure 3.1. The two orthogonal factors represent the two dimensions of the Eysenck neuroticism and extraversion subscales.

Chapter 3

Figure 3.1 VSS Goodness-of-Fit In Relation to the Number of Factors Extracted (Varimax Rotation) EPQ Measure



(ii) Paulhus Spheres of Control Questionnaire

In the principal axis analysis, the five-factor solution indicated eigenvalues of 4.57, 1.40, 1.16, 0.89, and 0.67 for the first study, and 2.88, 1.28, 1.06, 0.88, and 0.70 for the second study. Whilst these results and the scree plots suggest two common factors, the variables did not load as clearly as those in the EPQ. For instance, both Q7 and Q9 had $h^2 \leq 0.1$ (Study 1). However, except for two items from the personal efficacy subscale (Q3 and Q11), the variables which loaded onto the first factor predominately reflected the interpersonal locus of control dimension defined by Paulhus.

In the second study, most of the items which showed salient loadings on Factor 1 (interpersonal LOC) had relatively high values, except for Q6, which reflected personal efficacy. It is interesting to note that Q3, Q11 and Q6, which did not show the expected pattern of factor loadings, are reverse scored statements.

Results from the VSS analysis suggested an optimal solution of only one factor for both the data sets. The maximum goodness-of-fit index were 0.801 and 0.608 when one factor was extracted. Table 3.2(a) and (b) summarizes the results of the analyses for the Paulhus Spheres of Control items.

Table 3.2 (a) Summary Statistics for VSS Analyses (Study 1, N=117)
Paulhus Spheres of Control Questionnaire

Number of	Rank of Items				
Factors	1	2	3	4	5
1	**0.801**				
2	0.697	0.801			
3	0.707	0.824	0.893		
4	0.676	0.812	0.901	0.926	
5	0.676	0.742	0.883	0.919	0.934

VSS goodness of fit index for Rank 1 solutions reaches a maximum (of **.801**) when 1 factor is extracted.

Table 3.2 (b) Summary Statistics for VSS Analyses (Study 2, N=121)
Paulhus Spheres of Control Questionnaire

Number of	Rank of Items				
Factors	1	2	3	4	5
1	**0.608**				
2	0.585	0.712			
3	0.388	0.752	0.768		
4	0.318	0.708	0.781	0.813	
5	0.309	0.687	0.754	0.811	0.832

VSS goodness of fit index for Rank 1 solutions reaches a maximum (of **.608**) when 1 factor is extracted.

(iii) Work Preferences

In addition to examining the factor structure of the personality scales, the two factor analysis procedures were used to explore the dimensions of the work preferences questionnaire. The purpose of the analysis was to validate and refine the items in the scale. The data (n=624) used for the exploratory analysis were taken from a study of occupational stress among driving examiners (Parkes, personal communication, 1986).

Chapter 3

Principal axis factoring and the VSS procedure were applied to the data in order to determine the highest loading items on the two *a priori* defined factors. The eigenvalue plots and factor solutions from principal axis factoring of both forms of the WPQ showed that two or three factors could be extracted. In the following discussion, Form A of the WPQ refers to data obtained from the first assessment of the questionnaire, that is, the "ideal" job characteristics; Form B refers to the "actual" job description of the WPQ. Communality values for the 26 items in Form A were generally higher than those for Form B. Six of the variables in the two-factor solution in Form A had h^2 values ≤ 0.2 compared with 13 variables with $h^2 \leq 0.2$ in Form B.

18 items loaded on the first factor and the remaining eight variables on the second factor. Items which loaded most strongly on Factor 1, labelled "Esteem-Social", reflected work characteristics that were challenging, meaningful and interesting. Other items which loaded moderately on this factor were social aspects of the job, for instance, opportunities to talk with colleagues, meeting people, being of service to others. The eight items which loaded on Factor 2 reflected a strong orientation towards the "non-personal" aspects of work and were concerned with work routines, workload and the nature of the surrounding work environment. It was labelled "Work Routines".

In order to fit a better factor solution, the analysis was repeated excluding items which showed weak loadings or did not load clearly on either factor; the criteria for dropping variables were $h^2 \leq 0.2$ for Form A and $h^2 \leq 0.15$ for Form B of the questionnaire. The lower cut-off criteria of 0.15 was used for Form B because of the greater number of variables (13) with $h^2 \leq 0.2$. The results of the re-analysis, in which 20 variables were examined, showed a much clearer factor structure. 14 variables loaded clearly on factor 1 and six variables on factor 2 for both forms of the questionnaire.

An examination of the items omitted from the analyses revealed that those variables with $h^2 \leq 0.2$ in Form A (A3, A5, A6, A15, A20, A23) corresponded to those variables with $h^2 \leq 0.15$ in Form B (B3, B8, B10, B11, B19).

The results of the VSS analysis of the 26-item WPQ indicated only one optimal factor. Re-analysis of the 20-item WPQ (in which six weak loading items were removed) showed a maximum goodness-of-fit index of 0.746 for the "job preferences" section (Form A) when two factors were extracted. A summary of the VSS analyses are given in Table 3.3 and Figure 3.2 shows the VSS goodness-of-fit index for the Rank 1 solution in relation to the optimal number of factors for both forms of the WPQ.

Table 3.3 (a) Summary Statistics for VSS Analyses
Work Preferences Questionnaire Form A ("Preferred" Work, 20-items)

Number of	Rank of Items				
Factors	1	2	3	4	5
1	0.682				
2	**0.746**	0.904			
3	0.529	0.826	0.939		
4	0.375	0.748	0.926	0.956	
5	0.370	0.759	0.928	0.962	0.967

VSS goodness of fit index for Rank 1 solutions reaches a maximum of (**0.746**) when 2 factors are extracted.

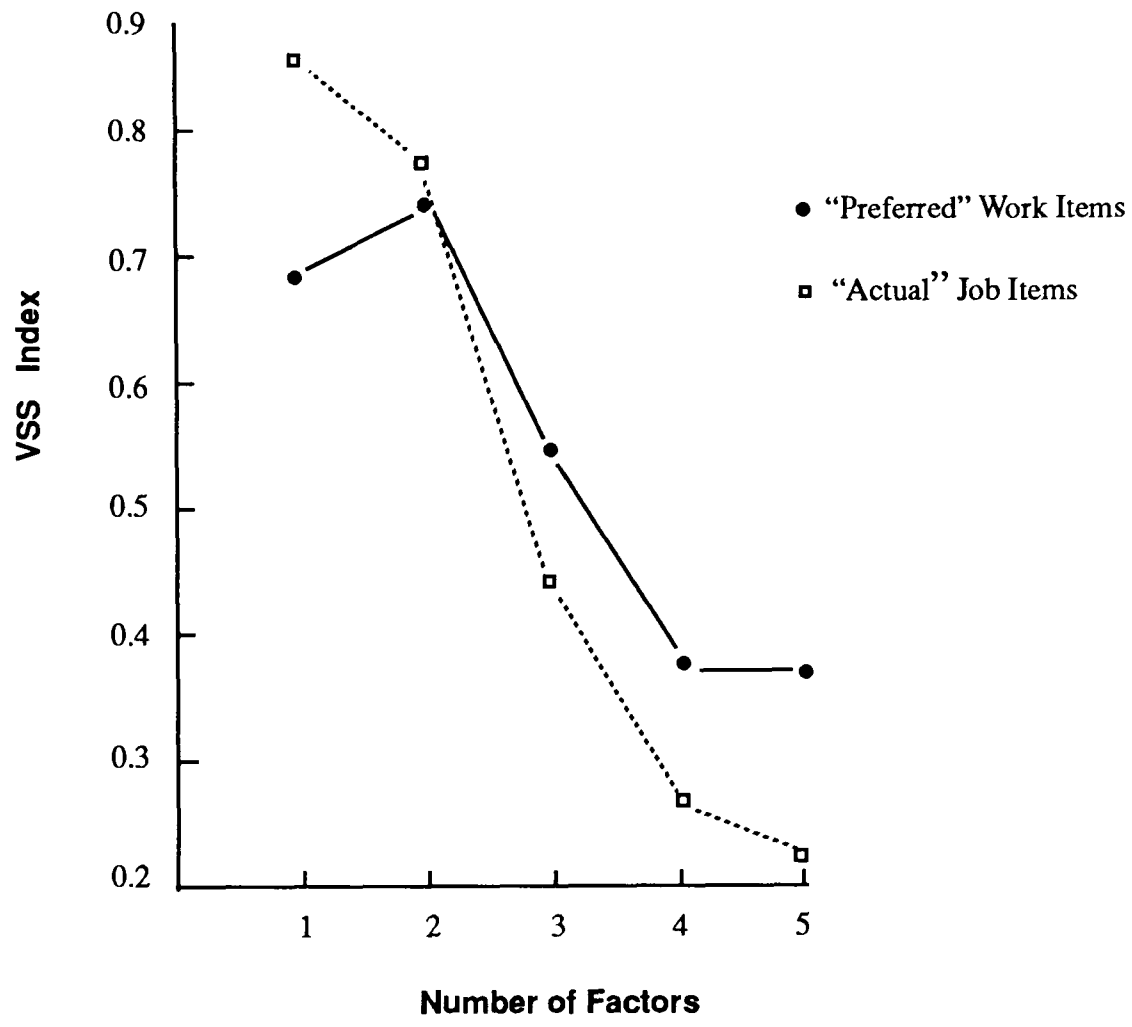
Table 3.3 (b) Summary Statistics for VSS Analyses
Work Preferences Questionnaire Form B ("Actual" Job, 20-items)

Number of	Rank of Items				
Factors	1	2	3	4	5
1	**0.871**				
2	0.770	0.941			
3	0.431	0.881	0.958		
4	0.273	0.744	0.928	0.970	
5	0.198	0.612	0.835	0.858	0.841

VSS goodness of fit index for Rank 1 solutions reaches a maximum of (**0.871**) when 1 factor is extracted.

Chapter 3

Figure 3.2 VSS Goodness-of-Fit In Relation to the Number of Factors Extracted (Varimax Rotation) Work Preferences Questionnaire



Based on the results of these analyses, the 20 items from Form A of the questionnaire were used to construct the two subscales, 'Esteem-Social" (14 items) and 'Work Routines" (6 items) for use in Study 2 of this thesis.

Chapter 3

Publishing Company Data

Data on personality traits, perceived work demands, social support, and health outcome were collected from staff of a publishing company at two time points, about nine months apart. The firm had planned to relocate to another site and the longitudinal study was designed to evaluate the impact of changes in the work environment on work satisfaction and mental well-being. However, because of considerable loss of subjects at the second assessment, the study was aborted. A summary of the main variables assessed in this study (n=45) are given in Table 3.4. and Table 3.5

Table 3.4 Summary Statistics for Work, Personality, Social Support & Mental Health Measures

	Study 1			Study 2 (Time 1)			Study 2 (Time 2)			Study 3 (Time1)			Study 3 (Time 2)		
Measure	M	SD	α	M	SD	α	M	SD	α	M	SD	α	M	SD	α
1. Extraversion	7.21	3.43	.82	7.67	3.12	.82				7.38	3.55	.88			
2. Neuroticism	4.36	3.21	.82	4.33	0.63	.77				5.22	2.98	.75			
3. Interpersonal LOC	47.91	10.67	.67	48.55	8.30	.74				47.73	10.08	.76			
4. Personal Efficacy LOC	49.30	8.77	.57	51.07	6.38	.71				48.42	7.02	.76			
5. nAch+ve	19.36	3.14	.78												
6. nAch-ve	11.99	4.11	.87												
7. Job Demand	19.82	4.20	.80	17.25	4.20	.87	16.90	4.41	.86	21.78	4.57	.81	20.78	4.16	.83
8. Job Discretion	24.81	4.53	.79	22.85	5.34	.74	21.92	5.51	.89	24.20	5.68	.86	24.51	4.12	.89
9. ISEL Total	25.04	4.95	.87												
10. Support - Supervisor	3.30	0.88		16.61	4.26	.87	15.44	4.70	.88	15.10	4.19	.87	15.55	4.40	.83
11. Support - Coworker	3.27	0.82		9.82	2.46	.78	9.59	2.66	.82	9.85	2.58	.68	9.98	2.34	.77
12. Support - Partner	3.12	0.99		6.17	4.57	.93	7.23	4.57	.93	8.33	3.82	.90	8.98	4.46	.89
13. Support - Friends	2.69	1.08		9.64	2.84	.67	9.04	2.98	.78	9.35	3.91	.88	8.50	3.12	.85
14. Job Satisfaction	11.08	2.86	.87	11.74	2.70	.89	10.32	3.43	.89	10.29	3.01	.84	10.27	2.89	.87
15. Social Dysfunction				6.10	2.88	.68	6.71	2.87	.74	6.67	3.00	.77	6.71	2.28	.79
16. GHQ12	10.88	4.30	.86	9.92	5.10	.83	11.20	5.30	.84	11.75	6.56	.89	11.02	4.39	.86

☛ Study 1: $N = 117$; Study 2: $N = 121$. Study 3: $N = 45$. No α values (Cronbach's Alpha coefficient) are shown for Study 1 work social support measures because these were single item variables. Blank entries indicate variable was not assessed. Study 3 was a longitudinal study of employees in a publishing company.

Chapter 3

Table 3.5 Person Correlation Coefficients and Changes in Work, Job Characteristics Between Time 1 and Time 2 Assessments for Males (N=16) and Females (N=29)

Publishing Company Data (N=45)

MALES

Variable	Stability Coeff.	Time 1 M	Time 1 SD	Time 2 M	Time 2 SD	t Value
Work Measures						
1. Hours work per week	.959***	45.87	9.50	45.56	7.23	*ns*
2. Job Discretion	.514*	26.00	5.32	25.88	3.38	*ns*
3. Job Demand	.808***	20.88	5.02	19.69	5.13	1.51
4. Support - Boss	.815***	15.73	4.48	14.73	4.71	1.38
5. Support - Coworkers	.509*	9.47	2.06	10.00	2.10	- 1.00
6. Support - Spouse/partner	.772***	9.40	5.11	10.07	4.68	*ns*
7. Support - Friends/relations	.770***	8.80	3.96	8.40	3.99	*ns*
Outcome Measures						
8. Job satisfaction (total)	.389	10.50	2.65	9.87	3.73	*ns*
9. Self-reported health	.809***	2.81	.83	2.93	0.77	- 1.00
10. GHQ12	.083	10.73	5.86	11.53	4.26	*ns*
11. GHQ Social Dysfunction	.093	6.40	2.65	7.40	2.60	*ns*

FEMALES

Work Measures						
1. Hours work per week	.412*	40.19	5.68	40.59	4.59	*ns*
2. Job Discretion	.495***	23.21	5.70	22.75	4.34	1.21
3. Job Demand	.826***	22.28	4.31	21.39	3.47	*ns*
4. Support - Boss	.368*	16.55	3.95	15.97	4.26	*ns*
5. Support - Coworkers	.372*	10.21	2.21	9.97	2.49	*ns*
6. Support - Spouse/partner	.786***	6.59	4.68	8.41	4.31	- 3.32***
7. Support - Friends/relations	.587***	8.37	3.11	8.55	2.87	*ns*
Outcome Measures						
8. Job satisfaction (total)	.581***	10.17	3.21	10.48	2.34	*ns*
9. Self-reported health	.475***	2.58	1.09	2.62	0.86	*ns*
10. GHQ12	.504***	12.28	6.93	10.97	4.45	1.16
11. GHQ Social Dysfunction	.333†	6.79	2.50	6.35	2.02	*ns*

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†$p \leq 0.07$. *$p \leq .05$. **$p \leq 0.25$. ***$p \leq 0.01$.

Entries for stability coefficients were Pearson correlation coefficients between measurements at Time1 and Time 2.

3.4 Discussion

The main purpose of the factor analysis was to clarify the dimensional structure of the two personality questionnaires used in the present work. The results generally confirm the validity of the scales examined. In addition, the findings demonstrate that the variable set in the subscales corresponded closely with those of the original measures, particularly the EPQ. Each variable in the 24-item neuroticism and extraversion scale loaded clearly on the respective dimension. However, principal axis factoring and the VSS analysis produced somewhat different solutions in relation to the "number of factors problem" for the Paulhus Spheres of Control scale. While the results from both exploratory methods of factor analysis confirmed the two-dimensional nature of the EPQ questionnaire used in the present study, the VSS approach indicated that the one-factor solution was appropriate for the locus of control measure.

One reason for the different factor solutions may be due to the psychometric characteristics of the EPQ and the Paulhus SOC measures. The EPQ appears more robust as far as the intercorrelations of the items are concerned and they showed stronger salient loadings in the factor matrix pattern. The overall reliabilities[3] for the neuroticism ($\alpha = 0.82$, $\alpha = 0.77$) and extraversion ($\alpha = 0.84$, $\alpha = 0.82$) measures were also higher compared with the Paulhus LOC scale ($\alpha = 0.82$, $\alpha = 0.74$) for interpersonal control, and personal efficacy ($\alpha = 0.67$, $\alpha = 0.71$). A recent study of the factor structure of the SOC scale by Parkes (1988) showed that although results from a series of confirmatory factor models using LISREL analysis supported the three-dimensional formulation of Paulhus's perceived control in the personal, inter-personal and socio-political behavioural domains, the personal and interpersonal domains were closely related. In the present investigation, the VSS analysis found a general locus of control factor but two underlying bi-factors were also

3. Cronbach's α reliability coefficient. Alpha values for Study 1 and Study 2 respectively.

clearly evident in the rotated factor matrix, with items loading on either the personal or interpersonal factor.

Another possible explanation is that the VSS approach is considerably more conservative in its estimate of the proper number of factors that should be extracted from a particular data set. Using simulated and empirical data sets, Revelle and Rocklin (1979) demonstrated that the technique tended to indicate fewer factors than other approaches. The present analyses suggest that one or two orthogonal factors could be extracted from the Paulhus SOC measure, depending on whether principal factor analysis, or the more conservative VSS technique was used. In the light of the original conceptualization of the Spheres of Control scale and other studies that have found some evidence for the personal and interpersonal domains (e.g. Parkes 1988) the present studies adopted the two-factor solution.

Finally, the findings suggest that the VSS technique, in conjunction with other methods of factor analysis, provides a useful way of clarifying issues about dimensional structure. The present study was mainly concerned with confirming already established questionnaire measures and the results further illustrate the potential value of the VSS method as a means of verifying factor solutions produced by other factor analytic procedures. Furthermore, the technique may be of particular use in the development of new psychometric measures as it has the advantage of discouraging over-factoring.

Chapter Four

Social Support and Well-Being Among Small Enterprise Owners and Employees

Summary

This study examined the role of social support and individual differences as moderators of stress arising from demands in the workplace. The research was based on a survey of full-time employees and self-employed, small-business owners. Data on personal, demographic and job characteristics as well as measures of individual traits, social support and health were collected by means of a questionnaire. The results showed significant differences in the work patterns and personality characteristics among the three groups of subjects but did not reveal occupational differences in well-being; working for oneself, or managing a small enterprise did not appear to be related to psychological health as compared with the employee group.

Interpersonal locus of control was the strongest predictor of perceived global support (ISEL). Extraversion, interpersonal control and need achievement were jointly predictive of ISEL scores. Extraverts and internals showed the highest amounts of perceived interpersonal support compared to introverts and external subjects. Global support predicted GHQ scores but not job satisfaction, whereas coworker support predicted job satisfaction but not GHQ scores. A negative buffering effect of support from friends on work demands was found in the prediction of GHQ. Overall, the findings from the present study provide evidence for the buffering role of social support and the "need-specificity" hypothesis (Cohen and Wills, 1985). It further suggests that the use of specific measures of social support for job and non-job settings could reveal which types of supportive relationships may (or may not) be useful in coping with stress in a particular situation. The importance of broadening the concept of social support to include individual differences in future research is also emphasized.

Chapter 4

4.1 Introduction

Work and Well-Being Among the Small Enterprise Population

In recent years, there have been a rapid and steady increase in the number of self-employed individuals and small firms in Britain. Running a business is often thought to be a physically and mentally demanding task. The owner is mostly responsible for the success or failure of the enterprise. Data from the General Household Survey (GHS, 1980), suggest that those who work for themselves work hard; more than half the male small business owners (n=226) reported working more than 50 hours a week. Curran, Burrows and Evandrou (1987) noted the existence of substantial information on work, leisure and health patterns relating to Britain's business population but also commented on the paucity of knowledge concerning the relationships between job factors and general well-being among this occupational group. Most of the available statistical information on the occupational health of small enterprise owners have come from the GHS, a large data set mainly constructed for purposes other than interest in the relationships between work and health.

A major problem with the GHS data is the suitability of the measures that have been used as indices of health status. As a result, some of the conclusions relating work, life-style and well-being have attracted some criticism. Macintyre (1986) pointed out that the three measures of health status used by the GHS (self-evaluations of respondent's health over the past year, chronic illness conditions, and short-term illnesses over the two weeks prior to interview) are not adequately correlated with each other, because "*Despite the high prevalence and incidence of reported health problems ... evaluations of health over the past year tended to be rather positive*" (p. 81). It is possible that although business owners report considerably higher levels of health complaints, they nevertheless perceive themselves as healthy because they are "protected" by certain personal and social resources such as "hardiness", or having adequate social ties and supportive others. In addition to information about demographic and occupational characteristics, data on the psychosocial

assets of entrepreneurs would provide a useful perspective from which to assess the effects of occupational demands on health.

Moreover, many investigations of occupational stress have been carried out across a range of work settings but few studies have compared work stress among small firms and the self-employed. The availability of such a sample for study provides a good opportunity for research into the relationships between work stress, psychosocial resources and adaptive outcomes.

4.2 The Present Study

The emphasis of the present study described in this Chapter is on the personality characteristics associated with social support and the role of supportive relationships in mitigating the effects of work stress.

(i) Personality Factors and social Support

One of the key findings that has emerged from current research points to the important role of individual differences in social support. Certain personality factors appear to influence the way in which people make use of their support resources and consequently, their responses to stress. For instance, there is some evidence that social support correlates positively with extraversion and self-esteem, and negatively with neuroticism (Sarason, Levine, Basham and Sarason, 1986). Duckitt (1984) found that extraverts showed a heightened sensitivity to variations in social support and reported less distress than do introverts under conditions of high support. Research on personal control belief have also established that internal LOC individuals tend to use support resources more effectively and show lower levels of anxiety and depression arising from life stress (Sandler and Lakey, 1982). In another study, Lefcourt (1985) demonstrated that internal persons appear to need more support than externals, benefitting more from its presence and

suffering more from its absence. Most people who are low in social support also tend to perceive their condition as one of isolation and discomfort.

On *a priori* grounds, it might seem that those personality factors that reflect the strength of social and affiliative needs and dependencies as well as personal beliefs about control would be important in understanding the influence of social support on psychological well-being.

There is also empirical evidence that one of the distinctive characteristics of successful entrepreneurs is achievement motivation (nAch), a construct which refers to the desire to do well in order to attain an inner feeling of personal accomplishment (McClelland, 1961). Need for achievement has also been found to be positively correlated with internal locus of control among entrepreneurs (Ahmed, 1985). Although there is little information about the relationship between nAch and extraversion, there is some evidence that the need for achievement is a significant determinant of resistance to organizational stress (Borucki, 1985). Possibly, nAch might also be related to social support.

Taken together, these findings suggest that certain personality traits may have differential effects on how people perceive the availability of social resources. The first objective of the study was therefore concerned with the question, "*What combination of personality factors influence the perception of perceived availability of social support?*" However, it would appear that interactive relationships (between personality traits) rather than main effects could better account for the prediction of perceived support. In order to elucidate these relationships, the present study explored the joint effects of extraversion, neuroticism, locus of control, and nAch in the prediction of perceived social support.

In view of studies which have found that internal locus of control is positively related to support and that extroverts have more social involvements than introverts, it is hypothesized that locus of control will act jointly with extraversion in the prediction of

perceived availability of social support. In addition, some studies suggest that those high in neuroticism tend to be initially less attractive to others in social interactions. Following from this, it is further hypothesized that locus of control will combine interactively with neuroticism in the prediction of perceived availability of support. The joint effects of nAch with extraversion and with locus of control are explored in examining the relationships between personality traits and perceived support.

(ii) Social Support, Work-Related Demands and Well-Being

The literature review in Chapter 2 noted that some investigators had raised questions about the variability in the effects of social support in moderating work demands. These writers argued that social support research might benefit from greater attention to the multi-dimensionality of the concept and in relating specific types of support to particular adaptive outcomes. In response to this suggestion, a number of researchers have developed measures which assess and differentiate between types of support and their effectiveness in offering protection from work related distress. Cohen and Will's (1985) "need-specificity" theory of support proposes that for social support to be effective, specific resources must be matched with the stressor. Apart from reviews which suggest that the type of support measure used, and hence particular types of support resources, may be linked to main or buffering effects reported in the literature, there is little in the way of empirical findings which directly investigated this "need-specificity" hypothesis.[4] Some studies have investigated different types of support e.g. emotional, esteem, and tangible aid, in moderating life and work stress, but few researchers have examined how job and non-job social interactions moderate work demands. The second objective of the present study was conceptualized in terms of the question, "*Does workplace support and non-work "global"*

4. Cohen and McKay (1984) and Cohen and Wills (1985) proposed that stress buffering occurs only when there is a match between the needs elicited by the stressful event and the functions of support that are perceived to be available.

support show different efficacious effects in mitigating the deleterious effects of work stress?"

Finally, the present study sought to examine whether perceived job demands, job autonomy and social support combined interactively to influence individual responses to work stress in relation to mental health. The predictions made by the Karasek "demand-control" model and the Johnson "demand-control-support" model of work stress were examined together with the research issues described above. The third objective of this research was concerned with the questions: (iii) *Does social support and work demand combine additively or interactively to predict job strain and mental health?* (iv) *Does high work demands, low work discretion and low social support result in the highest risk to psychological health?*

4.3 Method

Procedure

Data on objective characteristics of the work environment (e.g type of business, number of hours of work, number of staff), perceived work demands, social support, personality variables, general well-being, and demographic characteristics of participants were collected by means of a questionnaire designed to address the issues described in Section 4.2. 300 questionnaires were sent to a community sample of small business owners and employees in England and Wales. The first batch of 120 questionnaires was distributed in the Oxfordshire, London, and Cardiff areas through a small network of personal contacts known to the researcher. Each of these ten contacts handed out a questionnaire to their friends or colleagues at work. The second batch of 180 questionnaires was mailed to persons randomly selected from a list of 243 small businesses in and around the Hertfordshire and Luton region. The data were collected over a period of ten weeks, from November 1987 to January 1988.

Sample Description

The following response rates refer to subjects from the small firms and employee groups. Of the 180 questionnaires mailed to those in business, 18 were returned because the addressees had moved or ceased to operate their business. 56 persons responded giving a response rate of 34.6%. The employee group recorded a 58.3% return. A total of 126 participants responded to the survey giving an overall return rate of 44.7%. Nine respondents worked part-time and were excluded from the data set leaving 117 subjects for further analysis. Tables 4.1 shows the breakdown of the sample by occupational category and gender.

The age range of the sample (n=117) was 19 to 67 years (mean=37.49, sd=11.28). 61.5% (n=72) were male and 38.5% (n=45) were female. The majority of the employee group held non-manual, white-collar jobs (n=65, 92.9%). In contrast, the business activities of self-employed individuals and small business operators were highly diverse and ranged from engineering and information technology such as computer software development and the manufacture of industrial machinery to mobile hairdressers and home improvement services.

Table 4.1 Breakdown of Sample by Occupational Category & Gender

		OCCUPATIONAL CATEGORY		
		Employees	Self-Employed & Small Firms Owners	Total
GENDER	Male	31 (26.5%)	41 (35.0%)	72 (61.5%)
	Female	34 (29.1%)	11 (9.4%)	45 (38.5%)
	Total:	65 (55.6%)	52 (44.4%)	117 (100%)

		OCCUPATIONAL CATEGORY		
		Self Employed	Small Firms Owners	Total
GENDER	Male	15 (28.8%)	26 (50.0%)	41 (75.0%)
	Female	3 (5.8%)	8 (15.4%)	11 (21.2%)
	Total:	18 (34.6%)	34 (65.4%)	52 (100%)

4.4 Measures

4.4.1 Perceived Work Environment

(i) Job Demands and Job Decision Latitude

Psychological job demand, job decision latitude (or job discretion), and social support were the main work environment variables assessed in this study. Psychological job demand and job discretion were assessed by means of the Karasek Work Questionnaire. In addition to these measures of perceived work-related demands, open-ended questions elicited comments from subjects concerning what they felt to be the most important sources of work stress and satisfaction.

(ii) Social Support

Two functional measures of perceived social support were used, a global measure of social support and a measure of interpersonal relationships at work.

Global social support was assessed by means of the general population form of the Interpersonal Support Evaluation List (ISEL). The ISEL consists of a list of 40 statements and measures four support functions a person's social network might provide: appraisal support, belonging support, tangible support, and esteem support. Workplace social support was assessed using a modified version of the House (1981) work support scale.

4.4.2 Personality Characteristics

Six personality dimensions, neuroticism, extraversion, interpersonal locus of control (LOC), personal efficacy, and achievement motivation (positive and negative) were assessed.

Extraversion and Neuroticism

The short version of the Eysenck Personality Questionnaire (Eysenck, Eysenck and Barret, 1985) was used to assess extraversion and neuroticism. The scores for males and females obtained in the current sample are generally consistent with those reported by Eysenck, Eysenck, and Barret, shown in Table 4.2, for the age group 31-40 years.

Table 4.2 Means and Standard Deviations for EPQ-R Together With Normative Data.

Extraversion						Neuroticism						
(Males)			(Females)			(Males)			(Females)			
N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	Source
72	6.76	3.47	45	7.91	3.28	72	3.83	2.92	45	5.20	3.50	Present Study
53	6.40	3.85	38	7.37	3.18	53	5.75	3.46	53	5.50	2.92	Eysenck et al

However, the neuroticism scores for males were significantly lower than the normative data in the Eysenck et al sample. A *t*-test of the personality factors and health outcome by gender showed significant differences for neuroticism, $t = 2.28$, $p \leq 0.25$, but not for GHQ.

Locus of Control and Personal Efficacy

Interpersonal locus of control and personal efficacy, two subfactors of the locus of control construct were assessed by means of the Paulhus Sphere of Control (1983) scale.

Achievement Motivation

Achievement motivation has frequently been assessed using scales which appear to be primarily indices of "motive to achieve". However, results reported by Argyle and Robinson (1962) suggested that there may be different components within the personality construct which may be important in understanding how individual differences operate in regard to drive motivation. The Argyle and Robinson nAch questionnaire was used to assess two aspects of achievement orientation; "hopes for success" (nAch+ve) and "fear of failure" (nAch+ve). Each subscale consisted of five positive and negative worded statements about motives to perform, achieve and excel in everyday type situations. These statements were scored on a scale from one to five. High scores reflect high "hopes for success" and "fear of failure" attributes.

4.4.3. Measures of Outcome

Psychological well-being was assessed by means of the 12-item version of the Goldberg Health Questionnaire. There were no subscales in this measure of mental health. It should be noted that the GHQ is a "state" measure which gives information about current well-being (in the last six weeks), rather than a predictor of vulnerability to future disorder.

A breakdown of the GHQ scores showed somewhat higher levels of distress for the present sample, [males: mean=10.49, *sd*=4.06, *n*=72; females: mean=11.49, *n*=45, *sd*=4.66], in comparison with previous findings by Banks et al, [males=8.80, *sd*=4.02, *n*=552; females: mean=8.53, *sd*=3.65, *n*=83] (1980). However, the sample mean of 10.88

(*sd*=4.30) approximates more closely recent data reported by Parkes (1989), mean=9.13, *sd*=5.21.

Overall well-being was also assessed using a one-item health indicator. Work satisfaction was assessed using the three-item scale described in Chapter 3. A total job satisfaction score was created by summing across the three work satisfaction items.

4.4.4. Further Information

Other types of information collected for the purpose of this study included data on the firm such as number of staff, type of business, individual information e.g. work experience, hours of work per week, job level, and health and recreational activity.

4.5 Statistical Treatment

Statistical analyses of the data were carried out in two parts. The first part was mainly concerned with data screening and descriptive procedures and the second part with examining the relationships between personality factors, work environment, and mental health outcome.

4.5.1 Data Analysis: Part One

Univariate statistical procedures e.g. frequency listing, descriptive and correlational analyses, produced a description of the sample and the data were examined for possible errors in data entry and normality of distribution. Factor analytic procedures were used to test the validity of subfactors within each of the scales used in the questionnaire. Reliability coefficients were computed for all scales.

The sample was coded into three occupational categories; a "self-employed" group comprising subjects who work for themselves but employed no other persons, a "small firms" group made up of subjects who owned and managed a business employing up to 23 staff, and an "employee" group comprising subjects belonging to neither of the two prior categories.

The Scheffe test was used to determine if there were occupational differences between the three groups in terms of work characteristics, personality dimensions and work-related health outcomes.

4.5.2 Data Analysis: Part Two

(i) Multivariate Analysis

The second part of the data analysis was carried out using multivariate procedures and was mainly concerned with examining, first, the relations between social support and

personality factors, second, the additive and multiplicative effects of work demands, social support and personality variables in predicting job strain and psychological well-being.

Hierarchical multiple regression was the main statistical technique used in performing these analyses. This technique was adopted because it allows the unique partitioning of the total explained variance accounted for by the independent variables. Moreover, the emphasis in the present study is on testing for conditional relationships or interactions between variables. Although interactions may be studied directly by partitioning the data into subgroups on the conditioning variable using analysis of variance, this approach is not particularly suitable when the interaction variables are non-dichotomous as often occurs in stress research. Multiple regression techniques enable causal ordering of the independent variables to be specified and handles interactions (carried by the product terms of the variables) of any order or complexity involving research factors much more efficiently and without losing as much information compared with ANOVA procedures.

(ii) Estimating Main and Interaction Effects in Multiple Regression

Some researchers have pointed out the problems associated with interpreting main effects in the presence of interactions between variables because the magnitude and significance of main effects are dependent on the value of the moderator variable at which they are evaluated (Cleary and Kessler, 1982; Finney et al, 1984). The literature indicates that at least three different methods are available for testing and estimating main effects in the presence of significant interactions in regression analyses. These three methods are: (i) zero-point method in which all the variables are scaled positively with reference to a real zero point (ii) the average effect method (iii) the approach which assumes that there are no main effects present in an significant interaction. The relative merits of each of these

approaches have been discussed by Cleary and Kessler (1982) and Finney and his colleagues (1984).

In order to examine the nature of the significant interactions in which the main effect is evaluated at the average observed score on the moderator variable, the "average effects" method recommended by Finney et al is adopted. All variables used as independent predictors were transformed to zero means by subtracting the mean score from the variable score prior to fitting the regression equations. Interactions were represented by product terms (e.g. "stress" x support resource) and entered hierarchically only after the main variables forming the product had been entered as main terms, in accordance with normal statistical procedures for testing the significance of interaction effects[5] in regression analysis (see Cohen and Cohen, 1983; Stone and Hollenback, 1989).

(iii) Determination of Regression Coefficients

As recommended by Finney et al (1984), unstandardised regression coefficients were used to derive the regression equations for determining the effects of the predictor variables on the outcome measures. The coefficients were obtained from the simultaneous equations in which the (unstandardised) weights, β, were corrected for all the other variables in the model. All the independent variables were transformed to zero by subtracting their respective mean values prior to the analysis.

5. The ("stress" x support resource) interaction term represents the index of the difference between the slope of the stress-symptom relationship for persons high on the resource and the slope of the stress-symptom relationship for persons low on the resource.

4.6 Results

4.6.1 Descriptive Data

The following sections discuss first, the results from the analysis of variance and discriminant analyses concerning the characteristics of the occupational groups in relation to differences between work, individual differences, and outcome measures; second, the results of the regression analyses of personality factors and social support; third, the prediction of GHQ and job satisfaction outcome from a combination of predictor variables including demographic, personality, perceived work demands and social support.

Differences Between Occupational Groups: Employees, Self-Employed, and Small Business Owners.

Those working for themselves or running their own businesses had significantly longer years of job experience, worked longer hours, and were generally responsible for, or supervised, a greater number of people at work compared with those working for others. Small business owners tended to work the longest hours (mean=57.2). They also reported the highest levels of job demand. On the other hand, the size of the firm (defined as the number of people in the company) was, as anticipated, much smaller for the entrepreneur group[6]. Employees scored significantly lower in achievement motivation (nAch+ve) and job discretion than the entrepreneur group and were also higher in "fear of failure" as assessed by the negative motivation subscale (nAch-ve). In particular, small business individuals had the highest levels of job discretion; employees the least. The entrepreneur group had higher interpersonal control scores although this difference was only marginally significant (p= 0.06). The results of the one-way ANOVA are shown in Table 4.3.

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6. Entrepreneur group (n=52) refers to the combination of self-employed individuals (n=18) and small firms owners (n=34).

Table 4.3 One Way Analysis of Variance of Variables By Occupational Category

Variable	Group A		Group B		Group C		Contrast				
	Mean	SD	Mean	SD	Mean	SD	Group	t	p	df	F Value
Hours of Work/Week	41.37	6.02	50.28	11.94	57.21	10.21	K1	7.63	≤ .001		
							K2	8.83	≤ .001		
							K3	3.95	≤ .001		
							K4	2.81	≤ .01		
										2,114	40.28***
nAch +ve	18.45	2.95	20.11	3.03	20.71	3.05	K1	3.43	≤ .001		
							K2	3.58	≤ .001		
							K3	2.09	≤ .05		
										2,114	7.06***
nAch -ve	12.71	4.13	11.67	4.37	10.79	3.74	K2	- 2.23	≤ .05		
										2,113	2.55†
Job Demands	19.72	3.82	17.11	4.09	21.44	3.99	K2	2.08	≤ .05		
							K3	- 2.50	≤ .01		
							K4	3.80	≤ .001		
										2,113	7.26***
Job Discretion	23.05	4.67	25.33	3.71	27.85	2.64	K1	- 4.58	≤ .001		
							K2	5.61	≤ .001		
							K3	2.12	≤ .05		
							K4	2.14	≤ .05		
										2,114	15.92***
Job Satisfaction	10.38	2.88	11.67	2.68	12.09	2.60	K1	- 2.82	≤ .01		
							K2	2.91	≤ .01		
							K3	1.74	0.08		
										2,114	4.70***
GHQ	11.14	4.72	10.18	4.07	10.72	3.59	*ns*	*ns*	*ns*	2,114	< 1

*$p \leq .05$. **$p \leq .025$. ***$p \leq .01$. † $p \leq .08$

Group A: Employees ($n = 65$); Group B: Self-Employed ($n = 18$); Group C: Small Firms Owners ($n = 34$)

K1 - Contrast test for Group A with Group B and Group C; K2 - Contrast test for Group A with Group C only.

K3 - Contrast test for Group A with Group B only; K4 - Contrast test for Group B with Group C only.

4.6.2 Discriminant Analysis

A stepwise discriminant analysis was carried out to identify variables that would predict membership of the "self-employed", "small firms", and "employee" groups defined in Section 4.5.1. The results of this analysis are shown in Table 4.4.

Table 4.4 Discriminant Analysis of Groups Differing in Employment Status (N=117).

Variable	Rao's V	df	p	Rao's V Increment	df	p
1. Demographic Variables		10				
Gender	11.89		0.01	11.89	2	< .01
Age	12.83		0.01	0.94	2	*ns*
Marital Status	15.75		0.02	2.92	2	*ns*
Education	15.78		0.05	0.03	2	*ns*
Work Experience (Years)	18.85		0.04	3.07	2	*ns*
2. + Personality Measures		14				
Achievement Motivation (+ve)	31.99		0.001	13.14	2	< .001
Extraversion	36.68		0.000	4.70	2	*ns*
3. + Work Demand Measures		20				
Hours Work per Week	94.33		0.000	57.65	2	< .001
Job Demand	114.37		0.000	20.04	2	< .001
Job Discretion	120.16		0.000	5.79	2	< .05
4. + Work Satisfaction		26				
How much enjoyed work	125.66		0.000	5.50	2	≤ .06
How much fed up with work	129.91		0.000	4.25	2	*ns*
How satisfied with work	132.80		0.000	2.89	2	*ns*

(+) Indicates new step in the analysis.

Demographic variables (gender, age, marital status, education, previous work experience), personality trait factors (locus of control, achievement motivation, extraversion, neuroticism), work characteristics (hours of work, perceived job demand, job discretion) and work satisfaction were entered in successive steps. Within each of these predetermined steps, the variables were entered in a stepwise procedure; variables with the largest *F* values being entered first. Rao's V, a generalized measure of the separation of group centroids, was used to determine the significance of the predictor variables at each step as well as the overall significance of the model. The analysis specified equal "prior" probabilities for classifying the three groups. As shown in Table 4.4, gender, positive achievement motivation, all the work measures and one work satisfaction variable contributed significantly to discrimination between the three groups.

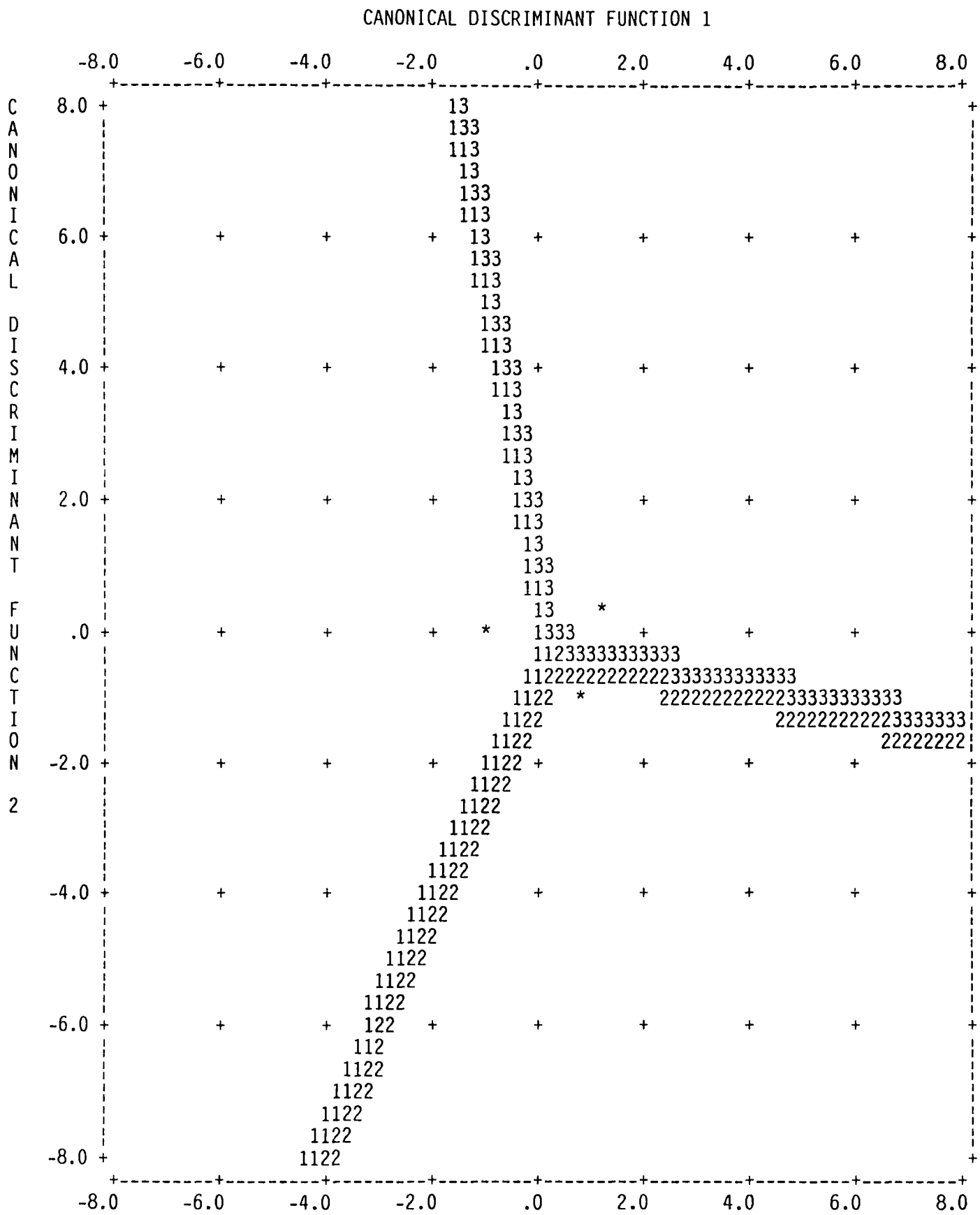
Two discriminant functions were obtained. The first function was highly significant ($\chi^2 = 90.91$, df = 26, $p < 0.0001$) and accounted for 80.26% of the overall discriminating power of the model. The canonical correlation was 0.71. Hours of work (discriminant coefficient = 0.86), achievement motivation, (discriminant coefficient = 0.38), and perceived job demand (discriminant coefficient = - 0.37) loaded most strongly on this function. The group means for this function showed that high nAch and high work hours most clearly distinguished small business owners from the two other groups. The second discriminant function was also significant ($\chi^2 = 22.00$, df = 12, $p \leq 0.05$) with perceived job demand (discriminant coefficient = 0.65), and two work satisfaction variables, "*how often fed up with job*" (discriminant coefficient = - 0.66) and "*how often satisfied with job*" (discriminant coefficient = 0.56) being the highest loading items. The canonical correlation was 0.45 and it accounted for the remaining 19.74% of the overall variance. Finally, the discriminant functions correctly predicted 84.6% (*n*=55) of cases in Group A (*n*=65), 66.7% (*n*=12) in Group B (*n*=18), and 70.6% (*n*=24) of cases in Group C. Overall, the model correctly classified 77.8% of all cases in the three occupational groups.

A separate analysis which specified "prior" probabilities equal to group size (probability values were 0.51, 0.17, and 0.32 for Group A, B, and C respectively) did not significantly affect prediction of group membership. The results showed that the model correctly classified 76.9% of all cases (84.6% for Group A, 72.2% for Group B, and 64.7% for Group C).

Figure 4.1 shows a territorial plot of group centroids and individual cases classified on the basis of the two canonical discriminant functions. The distance of the cases from the centroids indicates the "separateness" of the occupational groups. Group 3 subjects (small firms owners) were high on Function 1 and Function 2 whereas Group 2 subjects (self-employed) were high on Function 1 but low on Function 2.

Chapter 4

FIGURE 4.1 Classification Plot from Discriminant Analysis Showing General "Territory" for Each Occupational Group



Symbols used in Territorial Map:
Symbol 1: Employees (Group 0)
2: Self-employed (Group 1)
3: Small Business Owner (Group 2)

4.6.3 Personality and Social Support: Means, Standard Deviations, and Intercorrelations of Measures

The means, standard deviations and intercorrelations of measures of social support and personality are given in Table 4.5. Overall social support, a combined measure of appraisal, belonging, and tangible support, correlated with all the personality and outcome measures. It showed strong, positive associations with extraversion and interpersonal control. The ISEL was negatively correlated with neuroticism; similar associations have been reported by a number of investigators e.g. Caldwell and Reinhart (1988), Duckitt (1984), Sarason, Sarason and Shearin (1986). Furthermore, need achievement was also associated with overall support; "hopes for success" (nAch+ve) was positively related to global support while "fear of failure" (nAch-ve) showed an inverse relationship.

Moderate positive correlations were found for overall support with the outcome variables job satisfaction, self-ratings of health and the GHQ.

VSS analysis of the dimensional structure of the ISEL scale showed an optimal solution of only one factor; consistent with this result, the three ISEL subscales, appraisal, belonging and tangible support were highly inter-correlated. These intercorrelations, together with the results from analysis of the factor structure of the 30-item ISEL suggested that it would be more appropriate to consider the separate subscales in terms of an overall measure of social support in the present study. Accordingly, scores from the three subscales were summed to give an overall index of social support.

Table 4.5 Means, SDs, & Pearson Intercorrelations of Social Support, Personality, & Outcome Measures (N=117)

MEASURE	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Total ISEL Support	25.04	4.95	(.87)												
2. Appraisal	7.92	2.22	.82**	(.77)											
3. Belonging	8.12	2.36	.86**	.51**	(.82)										
4. Tangible	9.01	1.49	.74**	.43**	.52**	(.69)									
5. Extraversion	7.21	3.43	.45**	.39**	.45**	.20*	(.84)								
6. Neuroticism	4.36	3.21	-.22*	-.12	-.22*	-.21*	-.21*	(.82)							
7. Interpersonal LOC	47.91	10.67	.51**	.41**	.50**	.31**	.61**	-.40**	(.82)						
8. Personal Efficacy	49.30	8.77	.30**	.21*	.30**	.22*	.19*	.23*	.48**	(.67)					
9. nAch +ve	19.36	3.14	.26**	.32**	.16	.13	.32**	.13	.44**	.50**	(.57)				
10. nAch -ve	11.99	4.11	-.31**	-.26**	-.28**	-.21*	-.35**	.56**	-.60**	-.49**	-.40**	(.78)			
11. Job Satisfaction	11.08	2.86	.26**	.21*	.21*	.22*	.31**	-.42**	.38**	.36**	.44**	-.31**	(.87)		
12. Health	2.80	0.96	.20*	.15	.11	.27**	.13	-.33**	.23*	.12	.05	.21*	.29**	(. -)	
13. GHQ12	10.88	4.30	-.26**	-.17	-.25**	-.21*	-.36**	-.54**	-.37**	-.29**	-.16	.38**	-.53**	.39**	(.86)

Reliability of factor scales (Cronbach's alpha) shown in brackets. ** Significant at $p \leq 0.01$ *Significant at $p \leq 0.05$

No reliability values reported for single item measures; this is indicated by (. -).

4.6.4 Multiple Regression Analysis

4.6.4.1 Prediction of Social Support from Personality

Multiple regression analyses were carried out to determine whether personality factors predicted perceived social support (as measured by the ISEL), and the amount of variance they explained, after control for differences in demographic factors (age, gender, marital status and education). The predictor variables were entered into the analysis hierarchically in three pre-determined steps. Gender, age, marital status and education were entered first, as a single block. The personality trait variables, extraversion, neuroticism, need achievement, personal efficacy and interpersonal locus of control were entered next (Step 2). Finally, predicted interactions between extraversion, locus of control and achievement motivation were included in the regression. The statistical approach is described in detail in Section 4.5.

Table 4.6 shows the cumulative squared multiple correlation values, the successive increments at each step of the analysis and their significant values, and the overall significance of the model.

Table 4.6 Prediction of Global Social Support (ISEL) From Demographic and Personality Trait Measures.

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.032**	**.032**				**8.0**	
Gender			< 1	1,112	.92		-0.908
Age			< 1	1,112	.75		-0.019
Marital Status			1.41	1,112	.23		0.944
Education			1.96	1,112	.16		0.141
2. Personality Measures	**.318**	**.286**				**71.1**	
Extraversion			6.91	1,106	.01		0.516***
Neuroticism			< 1	1,106	.88		0.031
Interpersonal LOC			6.34	1,106	.01		0.083
Personal Efficacy LOC			1.64	1,116	.20		0.127*
Achievement Motivation (+ve)			< 1	1,106	.60		-0.009
Achievement Motivation (-ve)			< 1	1,106	.55		0.196
3. Interaction Terms	**.402**	**.084**				**20.9**	
Extraversion x Interpersonal LOC			6.10	1,103	.01		-0.030***
Extraversion x nAch(+ve)			5.82	1,103	.02		0.117*
Interpersonal LOC x nAch(+ve)			6.06	1,103	.02		-0.034**

$F(13,103)=5.34,\ p \leq 0.0001$, constant=25.83

*$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms.

None of the four demographic variables gender, age, marital status and education were significant in predicting social support. Extraversion and interpersonal control were both highly significant when entered in Step 2 of the analysis. On the next step, the three product terms extraversion x interpersonal control, interpersonal control x nAch+ve, and extraversion x nAch+ve significantly increased the squared multiple correlation to 0.402, accounting for 20.9% of the total explained variance. The overall multiple correlation was 0.558.

In order to examine the nature of the significant interaction effects, regression coefficients were determined from simultaneous regression analyses following the procedure described under Section 4.5.2. The interaction effects were derived from the results given in Table 4.5 and the regression equations are shown below:

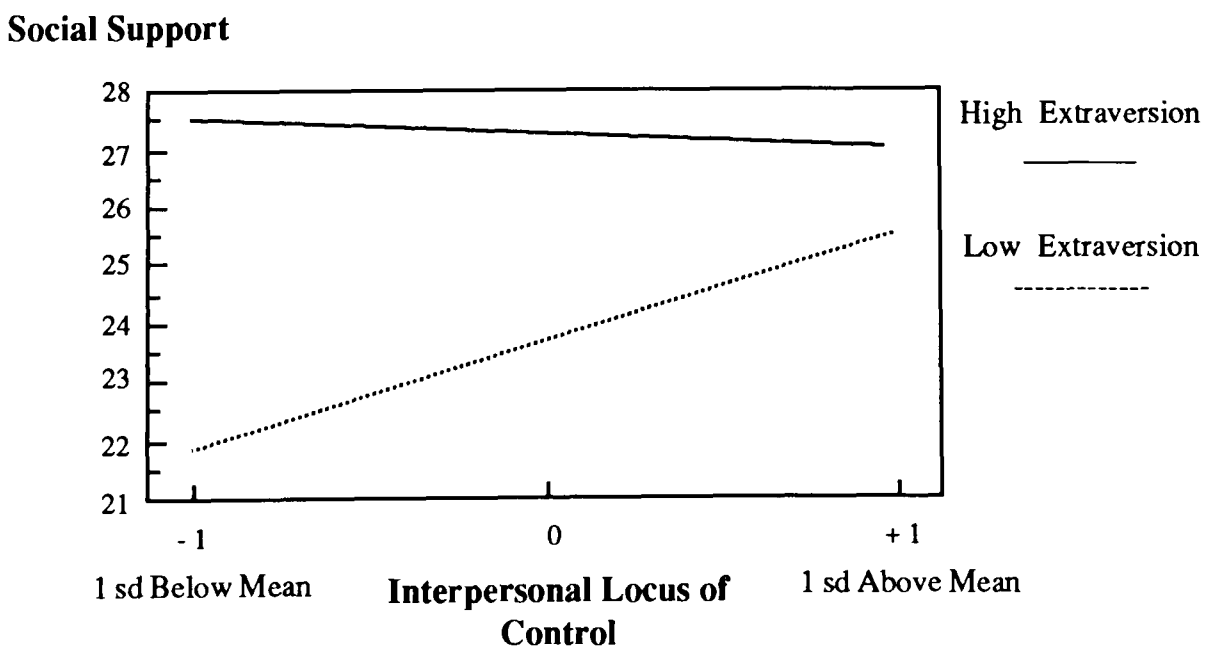
(i) Social Support = 0.516(Extraversion) + 0.083(Interpersonal Control)
+ (-0.030)(Extraversion x Interpersonal Control) + 25.83

(ii) Social Support = 0.516(Extraversion) + (-0.009)(nAch)
+ 0.117(nAch x Extraversion) + 25.83

(iii) Social Support = 0.083(Interpersonal LOC) + (-0.009)(nAch)
+(-0.034)(nAch x Interpersonal LOC) + 25.83

The equations were evaluated at mean levels of all demographic characteristics, neuroticism, personal efficacy, nAch-ve, and nAch+ve, interpersonal LOC and extraversion for each of the three respective interactions shown above. Figure 4.2 graphically presents the joint influence of extraversion and interpersonal control on perceived social support.

Figure 4.2 The Relation between Social Support and Interpersonal Locus of Control for High and Low Extraversion (EPQ-E)



For high extraversion subjects (one standard deviation above the mean), perceived support remained relatively consistent irrespective of level of interpersonal control, the variation being approximately 0.25 (y-axis) units over the range from -1 sd to +1 sd for interpersonal control (x-axis). In contrast, this effect was very marked for low extraversions subjects (one standard deviation below the mean), reflected by the steep gradient of the slope. The dotted line representing low extraversion indicates that support is strongly negatively related to interpersonal control; perceived support is lowest for subjects low in both extraversion and interpersonal control.

The interaction effects for extraversion x need achievement and need achievement x interpersonal LOC are given in Figure 4.3 and Figure 4.4.

Figure 4.3 shows that high extraversion is associated with generally greater amounts of support, and this effect is more pronounced for subjects with high nAch. The lowest levels of perceived support are associated with high nAch and low extraversion.

Finally, Figure 4.4 demonstrates that perceived support is conditioned by interpersonal LOC and need achievement. Low nAch predicts greater perceived support for those with high locus of control ("internals") but not for those with low locus of control ("externals").

Figure 4.3 Relation between Social Support and Need Achievement for High and Low Extraversion (EPQ-E)

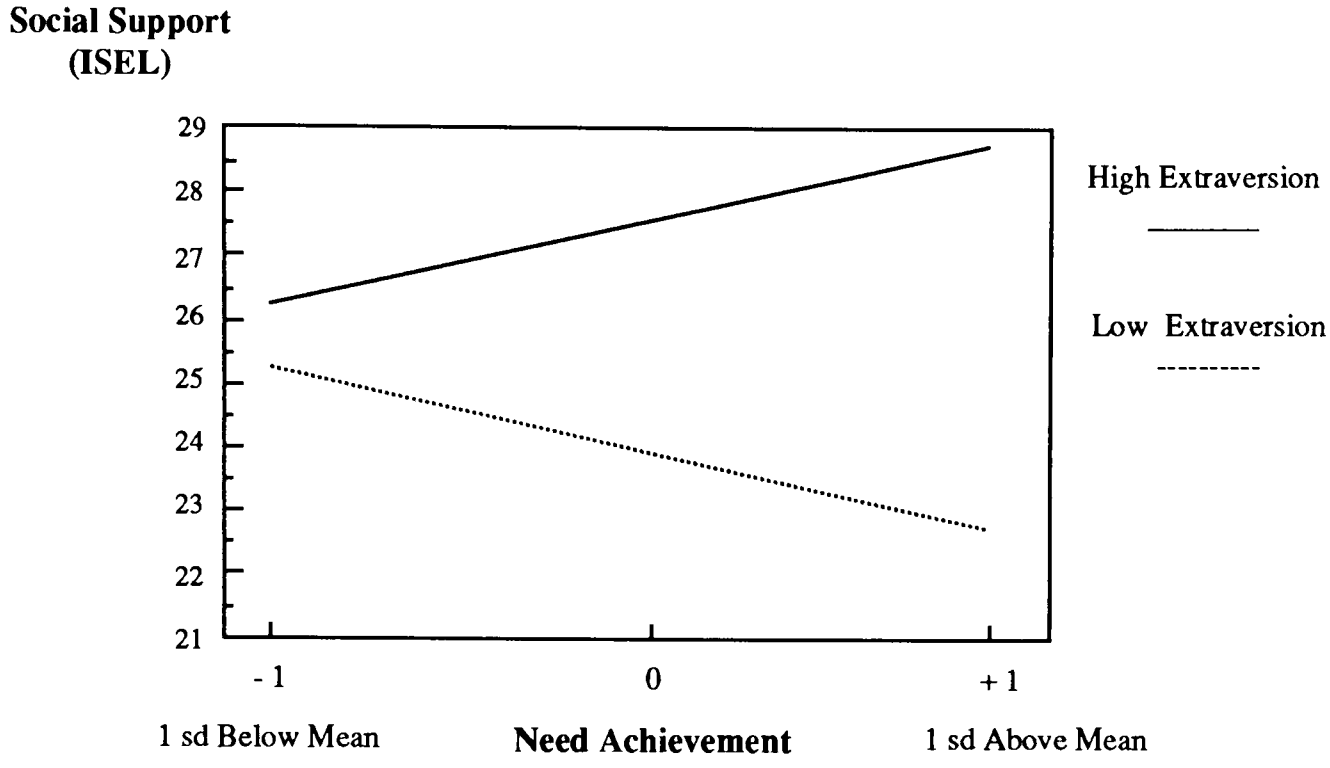
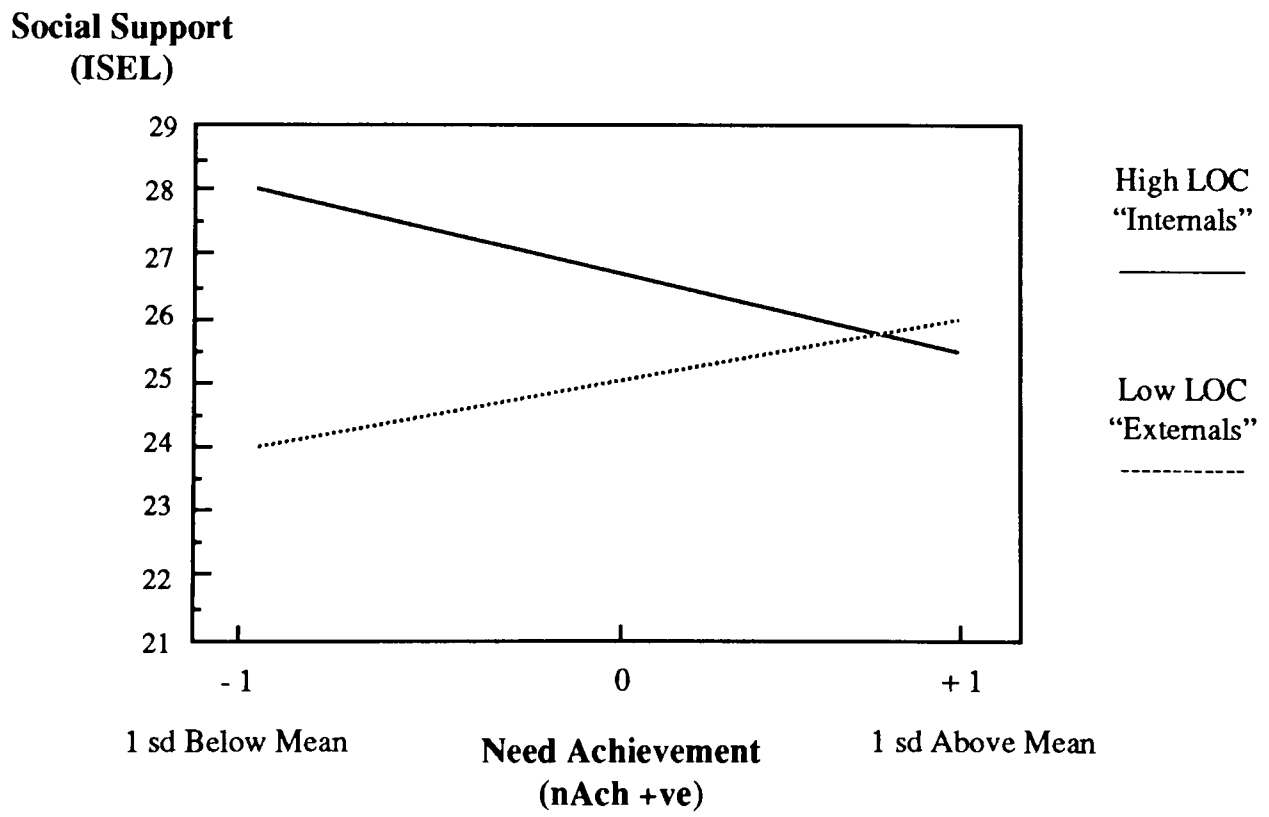


Figure 4.4 Relation between Social Support and Need Achievement for High and Low Interpersonal Locus of Control



4.6.4.2 Prediction of Outcome Measures

The means, standard deviations and intercorrelations for demographic, perceived work demands, social support and outcome measures (GHQ and Job Satisfaction) are shown in Table 4.7 and 4.8.

Table 4.7 Means, SDs, & Pearson Intercorrelations of Demographic, Work Environment & Outcome Measures (N=117)

MEASURE	M	SD	1	2	3	4	5	6	7	8
1. Gender	0.39	0.49	(. -)							
2. Age	37.49	11.28	- .20*	(. -)						
3. Marital status	0.59	0.49	- .31**	.37**	(. -)					
4. Education	1.97	1.01	- .02	- .11	- .01	(. -)				
5. Job demand	19.82	4.20	.03	- .19*	.06	.01	(.80)			
6. Job discretion	24.81	4.53	- .23**	.19*	.26**	.17	.17	(.79)		
7. Job satisfaction	11.08	2.86	- .18	.22*	.30**	.05	- .04	.57**	(.87)	
8. GHQ12	10.88	4.30	.11	- .20*	- .16	- .14	.31**	- .23*	-.53**	(.86)

Table 4.8 Means, SDs, & Pearson Intercorrelations of Social Support Variables & Outcome Measures (N=117)

MEASURE	M	SD	1	2	3	4	5	6	7
1. ISEL Support	25.04	4.95	(.87)						
2. Support-A	2.29	11.32	.09	(. -)					
3. Support B	2.92	1.13	- .01	.39**	(. -)				
4. Support-C	2.34	1.29	.17	- .21*	.03	(. -)			
5. Support-D	12.65	1.10	.12	- .16	.01	- .04	(. -)		
6. Job satisfaction	11.08	2.86	.26**	- .11	.07	.30**	- .14	(.87)	
7. GHQ12	10.88	4.30	- .26**	- .04	- .02	- .17	- .02	- .53**	(.86)

**Significant at $p \leq 0.01$; *Significant at $p \leq 0.05$. Reliability of factor scales (Cronbach's alpha) shown in brackets.

ISEL - Total social support score; Support A - Supervisor, B - Coworker, C - Partner/Spouse, D- Friends/Relatives.

Age, marital status, job discretion, global support (ISEL), and support from partner/ spouse showed moderate positive correlations with reported satisfaction at work; the strongest correlation was found with job discretion and job satisfaction ($r = 0.57$, $p \leq 0.01$). GHQ scores correlated 0.31 with job demand, - 0.53 with job satisfaction, and - 0.26 with the overall ISEL measure of social support. As expected, global support (ISEL) was positively correlated with job satisfaction and negatively correlated with GHQ scores, both correlation coefficients being significant at $p \leq 0.01$, consistent with data reported by Roos and Cohen (1987) and Cohen, Karmack, Mermelstein and Hoberman (1985). None of the four House work support measures correlated with job satisfaction or the GHQ measure.

A three-stage regression model was used to examine: (i) the extent to which demographic characteristics, perceived work demands and social support (main terms) predicted GHQ scores and job satisfaction (ii) whether social support moderated perceived work demands in relation to GHQ scores and job satisfaction (iii) the relative importance and contributions of personality, work factors and job satisfaction in the prediction of GHQ scores.

As in the regression analyses of social support and personality, the independent variables were entered hierarchically in pre-determined steps. Gender, age, marital status and education were entered first into the equation (Step 1). Perceived job demand, job discretion and social support were entered next. The cross-product terms for support with demand and with discretion were entered in Step 3. The full model is shown in Table 4.9.

Altogether, five different regressions were fitted for job satisfaction and for GHQ scores. Four of the analyses were concerned with examining each of the different sources of workplace social support (supervisor, coworker, spouse/partner, friends) and the fifth analysis examined the ISEL global support measure in relation to GHQ and job satisfaction.

4.6.4.3 Prediction of GHQ

(i) Work Stressors and Global Social Support (ISEL)

The results of the regression analyses of GHQ scores on perceived job demands and social support are presented in Table 4.9.

Table 4.9 Prediction of GHQ12 From Demographic, Work Environment Measures & Global Social Support

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.076**	**.076**				**30.8**	
Gender			< 1	1,112	.61		0.066
Age			3.34	1,112	.07		- 0.026
Marital Status			< 1	1,112	.46		- 0.612
Education			3.00	1,112	.09		- 0.409
2. Work Measures	**.216**	**.140**				**56.6**	
Job Demand			11.05	1,109	.01		0.324***
Job Discretion			4.13	1,109	.05		- 0.168*
Overall Social Support (ISEL)			3.33	1,109	.07		- 0.090
3. Interaction Terms	**.247**	**.031**				**12.6**	
Social Support (ISEL) x Job Discretion			4.46	1,108	.04		0.035*

$F(9,107)=4.42$, $p \leq 0.0001$, constant=10.74

*$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

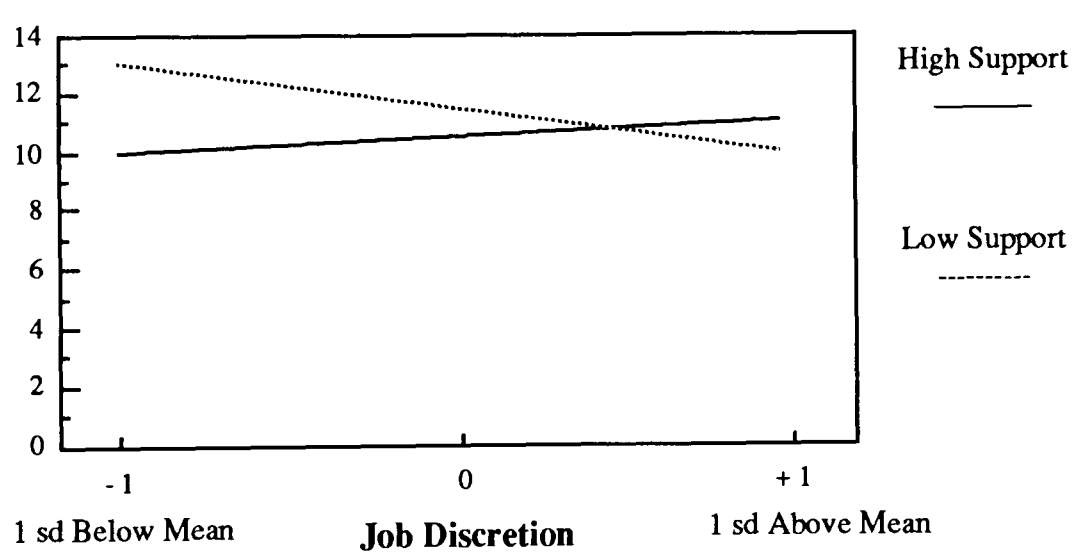
[a] The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms.

None of the variables entered in the first step to control for differences in the background of the subjects were significant in predicting GHQ scores. For age, however, the F value reach the $p \leq .10$ level. In Step 2, social support made a marginal contribution, while job demand and job discretion significantly added to the squared multiple correlation,

the three variables accounting for 35.8% of the total explained variance. Finally, on Step 3, the product term social support x job discretion added to the squared multiple correlation of the model increasing the R^2 value to 0.247.

The interaction between job discretion and social support is shown in Figure 4.5. The regression equation was derived from the results presented in Table 4.9. GHQ scores were determined at the mean for gender, age, marital status, education and perceived job demand.

Figure 4.5 The Effects of Job Discretion on GHQ for High and Low Levels of Social Support (ISEL)



GHQ = - 0.168(Job Discretion) + (-0.090)(Social Support) +
0.035(Job Discretion x Social Support) + 10.74

A strong buffering effect of social support on job discretion is evident from the almost horizontal gradient for those with high interpersonal support. For high support subjects, job discretion did not predict GHQ scores. In contrast, for low support subjects, GHQ was negatively related to job discretion. The highest levels of GHQ were associated with the combination of low support and low discretion.

(ii) Occupational Differences and the Prediction of GHQ

Occupational group, a variable denoting nominal classification of the "employee", "self-employed", and "small-firms owners", was entered as two dichotomous dummy variables, D_1 and D_2, with "employees" as the reference category. They were nonsignificant in the prediction of GHQ. This finding is consistent with results from the one-way analysis of variance which found no occupational differences in psychological well-being (Table 4.3). Within-level and across-level interactions for the demographic factors and work environment variables e.g. job demand x job discretion, occupational group x job demand, occupational group x job discretion, were also tested but were non-significant in the prediction of GHQ scores.

(iii) Work Stressors and Social Support (House scale)

There are four measures of social support in the House scale and although hierarchical multiple regression using product terms to carry the interactions (Cohen and Cohen, 1983) is the appropriate analytical model, there is flexibility in deciding how many (work-related) stressors and social supports will be examined in each regression analysis.

This decision involves some trade off between the power of the test and the amount of Type 1 error inflation. Power is sacrificed when all the variables are included in the regression. For instance, when the outcome measure is regressed on the (four) demographic, (two) work stressors, (four) social supports and all eight product terms for the support items (each social support x each stressor) as well as the product term for the

two work stressors (demand x discretion), the analysis consumes 19 degrees of freedom. An approach that uses a separate model for each support variable along with the demographic and work stressors will yield a higher power test but also more Type 1 error inflation. In this case, each of these regressions uses ten degrees of freedom but four different regressions need to be computed.

Both approaches were used in examining the main and moderating effects of the House measure of support on GHQ and job satisfaction. First, the more conservative method was adopted in which all the four sources of support, demographic variables and work stressors were included in the analysis. The results are given in Table 4.10.

Table 4.10 Prediction of GHQ12 From Demographic, Work Environment, & Social Support Measures

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.076**	**.076**				**24.4**	
Gender			< 1	1,112	.61		0.033
Age			3.34	1,112	.07		- 0.032
Marital Status			< 1	1,112	.46		- 1.050
Education			3.00	1,112	.09		- 0.395
2. Work & Social Support	**.207**	**.131**				**42.3**	
Job Demand			12.04	1,106	.01		0.424***
Job Discretion			5.89	1,106	.02		- 0.190
Work Support - Supervisor/Boss			< 1	1,106	.35		- 0.254
Work Support - Coworker			2.29	1,106	.63		- 0.061
Work Support - Spouse/partner			< 1	1,106	.78		0.227
Work Support - Friends/Relatives			< 1	1,106	.80		0.091
3. Interaction Terms	**.311**	**.103**				**33.3**	
Demand x Discretion			< 1	1,97	.57		- 0.014
Support Boss x Demand			3.71	1,97	.05		0.162*
Support Boss x Discretion			< 1	1,97	.93		- 0.008
Support Coworker x Demand			2.34	1,97	.13		- 0.138
Support Coworker x Discretion			< 1	1,97	.40		- 0.080
Support Partner x Demand			1.80	1,97	.18		0.113
Support Partner x Discretion			1.87	1,97	.18		0.010
Support Friends x Demand			11.70	1,97	.01		0.326***
Support Friends x Discretion			< 1	1,97	.54		- 0.056

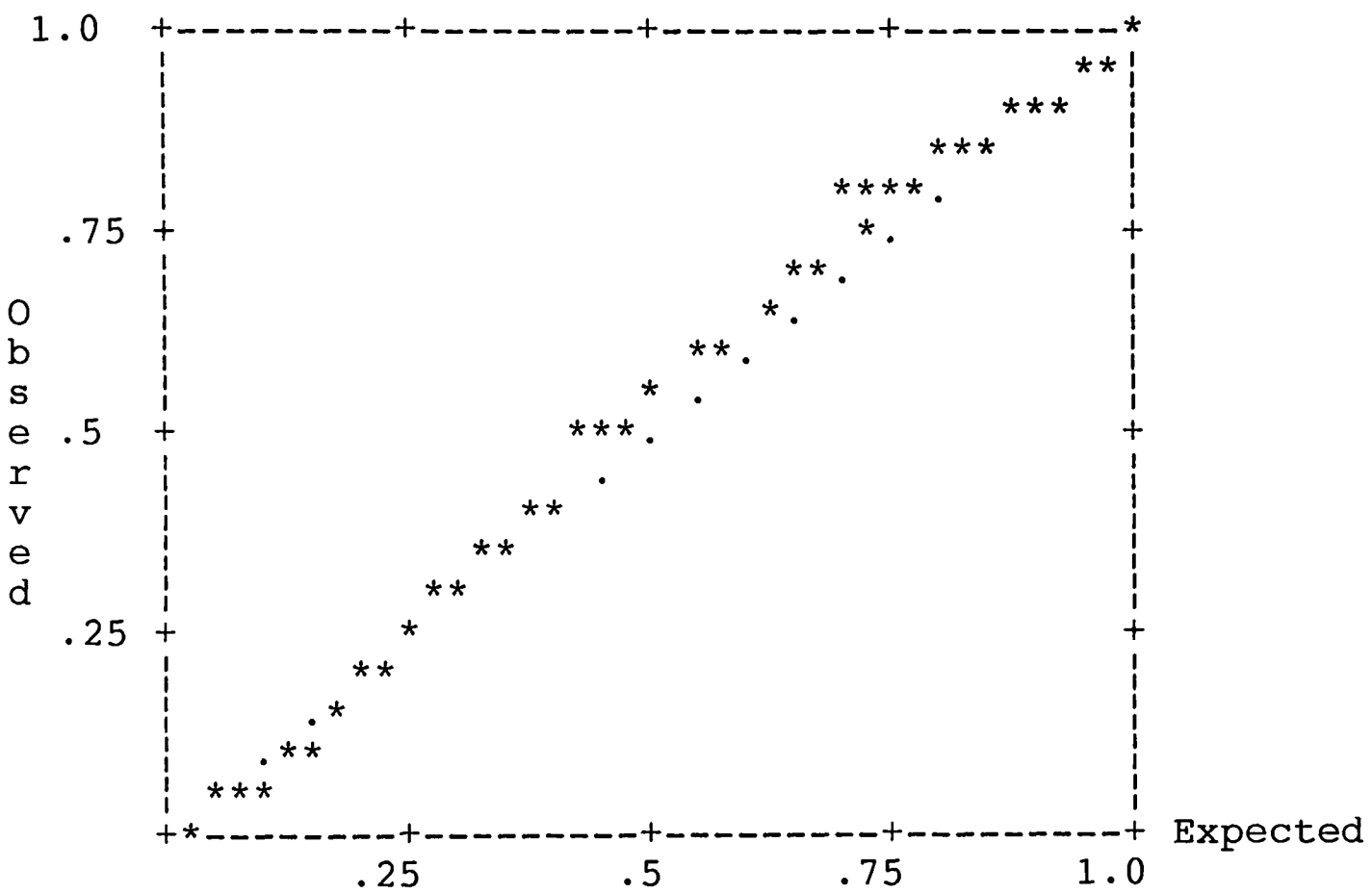
$F(19,97)=2.30$, $p \leq 0.001$, constant=11.10

*$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms.

A normal probability plot of the standardized residuals from the regression analysis is shown in Figure 4.6. An examination of the residuals indicate that the standardized residuals are normality distributed with no cases of outliers.

Figure 4.6 Normal Probability Plot of Standardized Residuals From Regression of GHQ



Normal Probability Plot Derived From Regression Analysis of GHQ - Table 4.10

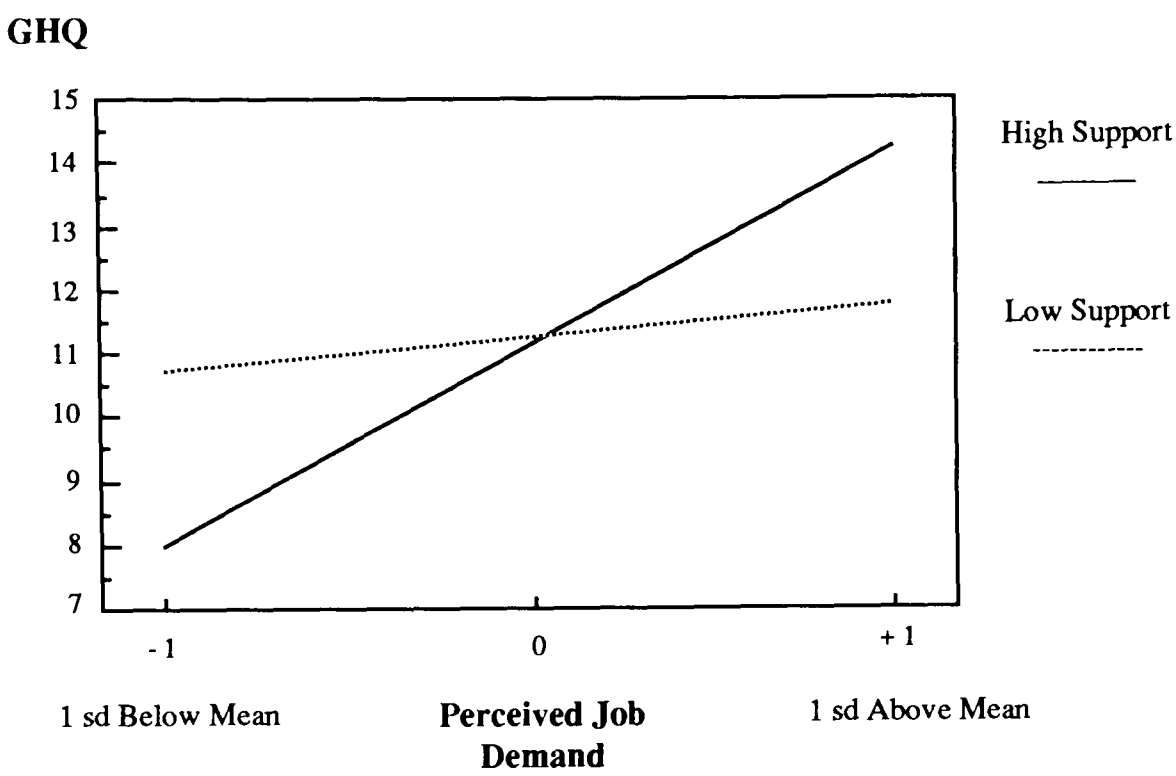
None of the four sources of workplace social support were significant when entered as main terms in Step 2 of the analysis (Table 4.10). Job demand and job discretion contributed significantly to the overall explained variance of the model. Cross-product terms were created by multiplying each of the four sources of workplace support with job demand and with job discretion, and were entered as a single block on the next step. The analysis revealed that the interaction term "support-friends x job demand" contributed to the overall squared multiple correlation over and above that accounted for by the demographic, work and social support variables already in the equation.

In order to confirm that the absence of moderating effects for the other sources of support was not due to the low power of the test, the alternate strategy of computing four separate regressions was implemented. The results from these four analyses revealed that only "support friends x job demand" was significant in predicting GHQ.

The interaction effect for "support-friends x job demand" is presented in Figure 4.7. The equation, derived from the results in Table 4.10 was evaluated at the mean of all demographic variables, job discretion, and all workplace support sources except friends support.

$$\begin{aligned} GHQ = {} & 0.091(\text{Support-Friends}) + 0.424(\text{Job Demand}) + \\ & 0.326(\text{Job Demand x Support-Friends}) + 11.10. \end{aligned}$$

Figure 4.7 The Effects of Job Demand on GHQ for High and Low Levels of Social Support (Friends)



The predicted interactions between demand and discretion and between demand, discretion and support were nonsignificant when the appropriate product terms were included in the regression.

Contrary to theoretical predictions of the buffering hypothesis, there was a stronger relationship between perceived job demand and GHQ under conditions of high support from friends than under conditions of low support. Figure 4.7 shows a partial "reverse buffering" effect as high support and high job demand is associated with the highest level of GHQ but not for high support and low demand which showed the lowest GHQ scores. In contrast with the usual moderating influence of social support on work stressors well-being remains stable over high and low levels of psychological job demands for low support individuals.

4.6.4.4 Prediction of Job Satisfaction

(i) Work Stressors and Global Social Support (ISEL)

A regression model similar to the one shown in Table 4.9 was used to determine whether the ISEL measure of global support predicted job satisfaction. There was a main effect of support, $F(1,110)=3.95$, $p= 0.049$, on job satisfaction but no significant interactions for support x job demand, support x job discretion, or support x demand x discretion were evident. The predicted demand x discretion interaction was also non-significant.

(ii) Work Stressors and Social Support (House scale)

As in the regression of GHQ scores for the House support items (see Section 4.6.4.3), a similar strategy was used to examine the additive and multiplicative effects of demographic, work stressors and social support on job satisfaction.

Table 4.11 summarizes results from the analysis in which all the House social support measures were included in the regression.

Occupational group and marital status were marginally significant in predicting job satisfaction when entered in the first step of the regression. Job discretion was highly significant when entered in the next step. When the product terms were included in the regression, only coworker support x job demand showed a significant R^2 increment in step three of the regression. This model was duplicated in four separate regressions in which the same demographic and work stressors were used as predictors including each of the four sources of support and their product terms. There was no evidence of main effects for the four support sources. Except for "coworker support x job demand" none of the 2-way (support x demand/discretion, demand x discretion) or 3-way product terms (support x demand x discretion) significantly added to the R^2 value of the model when entered after the main terms.

Table 4.11 Prediction of Job Satisfaction From Demographic, Social Support and Work Measures

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.148**	**.148**				**32.9**	
Gender			< 1	1,111	.77		- 0.110
Age			1.43	1,111	.23		0.002
Marital Status			4.24	1,111	.04		- 1.035
Education			< 1	1,111	.43		- 0.095
Occupational Group			4.29*	1,111	.04		0.785
2. Work & Social Support	**.398**	**.250**				**55.5**	
Job Demand			2.86	1,106	.09		- 0.107
Job Discretion			31.44	1,106	.00		0.307***
Work Support - Supervisor/Boss			< 1	1,106	.37		0.319
Work Support - Coworker			1.31	1,106	.26		0.320
Work Support - Spouse/partner			< 1	1,106	.66		0.034
Work Support - Friends/Relatives			< 1	1,106	.44		0.245
3. Interaction Terms	**.450**	**.052**				**11.6**	
Demand x Discretion			< 1	1,96	.87		- 0.008
Support Boss x Demand			< 1	1,96	.61		- 0.027
Support Boss x Discretion			< 1	1,96	.72		- 0.019
Support Coworker x Demand			5.55	1,96	.02		0.129**
Support Coworker x Discretion			< 1	1,96	.63		- 0.030
Support Partner x Demand			< 1	1,96	.54		0.032
Support Partner x Discretion			< 1	1,96	.57		- 0.026
Support Friends x Demand			1.48	1,96	.23		- 0.071
Support Friends x Discretion			< 1	1,96	.69		0.022

$F(20,96)=3.93$, $p \leq 0.001$, constant=10.93

*$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

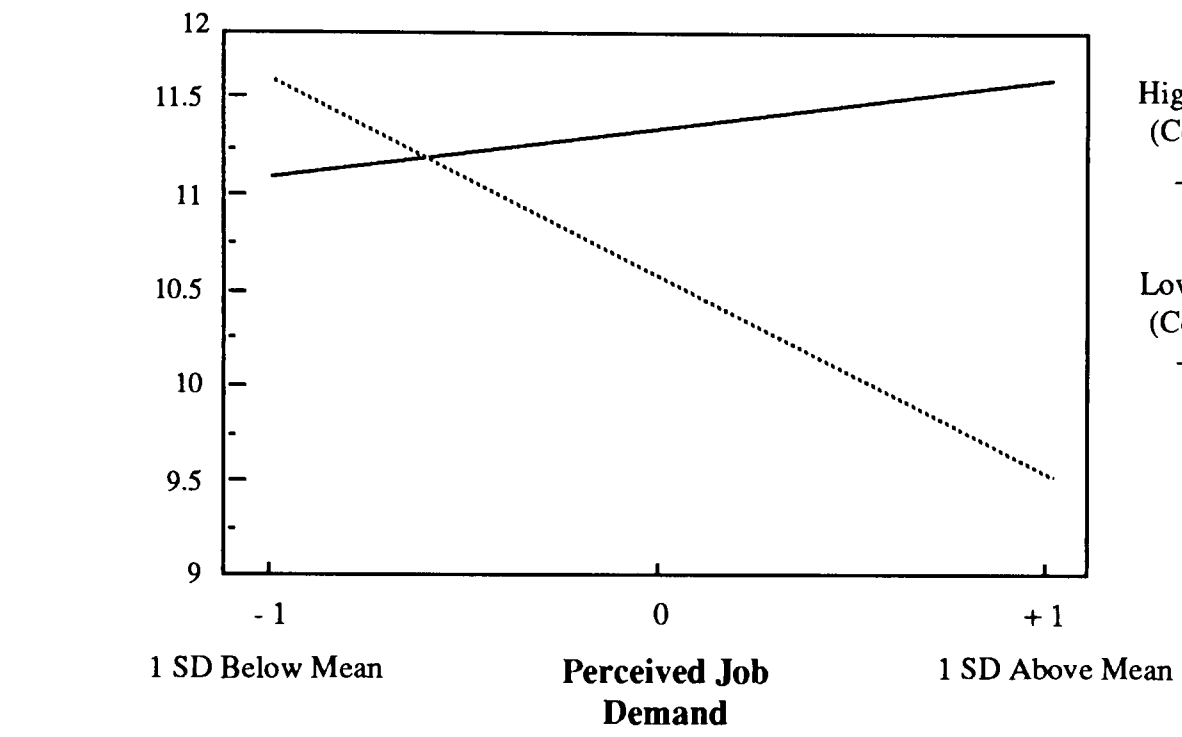
[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms.

The results from Table 4.11 were used to derive the regression equation for job satisfaction, evaluated at mean levels of all demographic variables, trait measures, hours of work, job discretion and support from supervisor/boss, spouse/partner and friends.

Job Satisfaction = -0.107(Job Demand) + 0.32(Coworker Support) +
0.129(Coworker Support x Job Demand) + 10.93

Figure 4.8 shows the joint influence of psychological job demand and coworker support on job satisfaction.

Figure 4.8 The Relation between Job Demand and Job Satisfaction for High and Low Levels of Coworker Social Support



For high support individuals, job demand was not related to job satisfaction; the slope of the line is relatively constant over one standard deviation above and below the mean level of job demand. For low support subjects, job demand was significantly associated with job satisfaction, the lowest job satisfaction occurring at high levels of job demand (+1 sd above mean).

However, high job demand coupled with high support is associated with the highest levels of work satisfaction. This suggests that perceived work demand may be an important factor (among other work environmental factors) in the experience of job satisfaction

although it is negatively correlated with job satisfaction ($r = -0.24$, $p \leq 0.01$) and positively associated with GHQ scores ($r = 0.31$, $p \leq 0.01$).

4.6.4.5 Further Exploratory Analyses

In the light of the findings reported here, further exploratory analyses were carried out to evaluate the relative importance of personality, work and job satisfaction variables in predicting GHQ. A regression model in which job satisfaction was included as a predictor was also examined.

(i) Contribution of Personality, Work and Job Satisfaction In the Prediction of GHQ

In order to assess the relative importance of personality, work and job satisfaction in predicting GHQ, three separate analyses were carried out. Each of the three types of predictors was successively dropped from the regression leaving only two predictor sets in the model. A summary of the results are given in Table 4.12.

All the decrements in the three reduced models, personality/work ($p= 0.002$), personality/job satisfaction ($p= 0.034$), and work/job satisfaction, ($p= 0.017$) were highly significant relative to the full model, indicating the relative strength of each of the three types of predictors. Each reduced model accounted for a significantly lower proportion of variance than the full model.

An earlier analysis which examined demographic, perceived demands and global support (ISEL) on GHQ, described in Table 4.9, was extended a step further to include job satisfaction (entered in Step 4) as a predictor. The results from this extended model showed that job satisfaction, $F(1,107)= 25.26$, $p \leq 0.001$, increased the R^2 value of the model from 0.247 to a highly significant 0.391 (R^2 change = 0.144). It is worth noting that the (significant) main effect of job discretion disappeared in the presence of the job satisfaction

Table 4.12 Personality, Work and Job Satisfaction in the Prediction of GHQ

Regression Model	Omitted Predictor
1. A + B F(10, 106)=7.22, p= .000, SMC=.405	C F(1,105)=10.47, p= .002, R^2 Ch=.054
2. A + C F(7, 109)=10.54, p= .000, SMC=.404	B F(4,105)=2.70, p= .034, R^2 Ch=.056
3. B + C F(5, 111)=13.32, p= .000, SMC=.375	A F(6, 105)=2.73, p= .017, R^2 Ch=.084

Full Model: A + B + C, $F(11,105) = 8.11$, $p \leq 0.001$, SMC = .459

☛

A: Personality Variables: Extraversion, neuroticism, interpersonal control, personal efficacy, nAch+ve, nAch-ve.

B: Work Variables: Job demand, job discretion, overall social support, overall social support (ISEL) x job discretion.

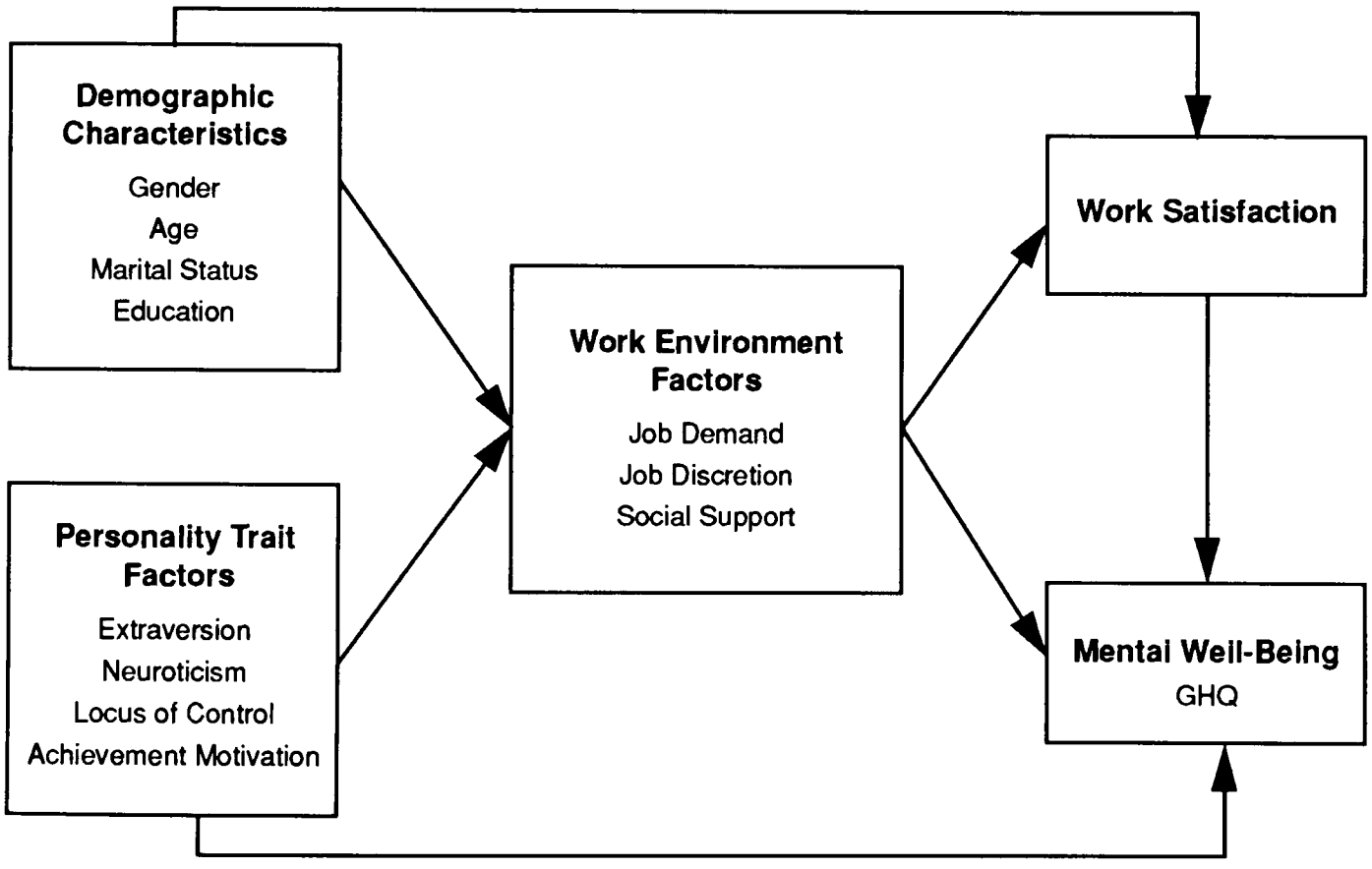
C: Job Satisfaction

variable, suggesting that the latter might operate as a mediating variable in the "stress-outcome" relationship.

(ii) Path Model Analysis of Job Satisfaction and GHQ scores

The method of path analysis was used to examine the likely causal connections between the demographic, personality, work, and outcome measures. A causal model was specified, (Figure 4.9) based on the conceptual framework described in the House research paradigm (Chapter 1) in which stress is viewed as an intervening variable with antecedent causes and behavioural and affective outcomes.

Figure 4.9 A Hypothesized Path Model of the Relationships Between Perceived Work Factors, Individual Differences, and Heath-Related Outcomes.



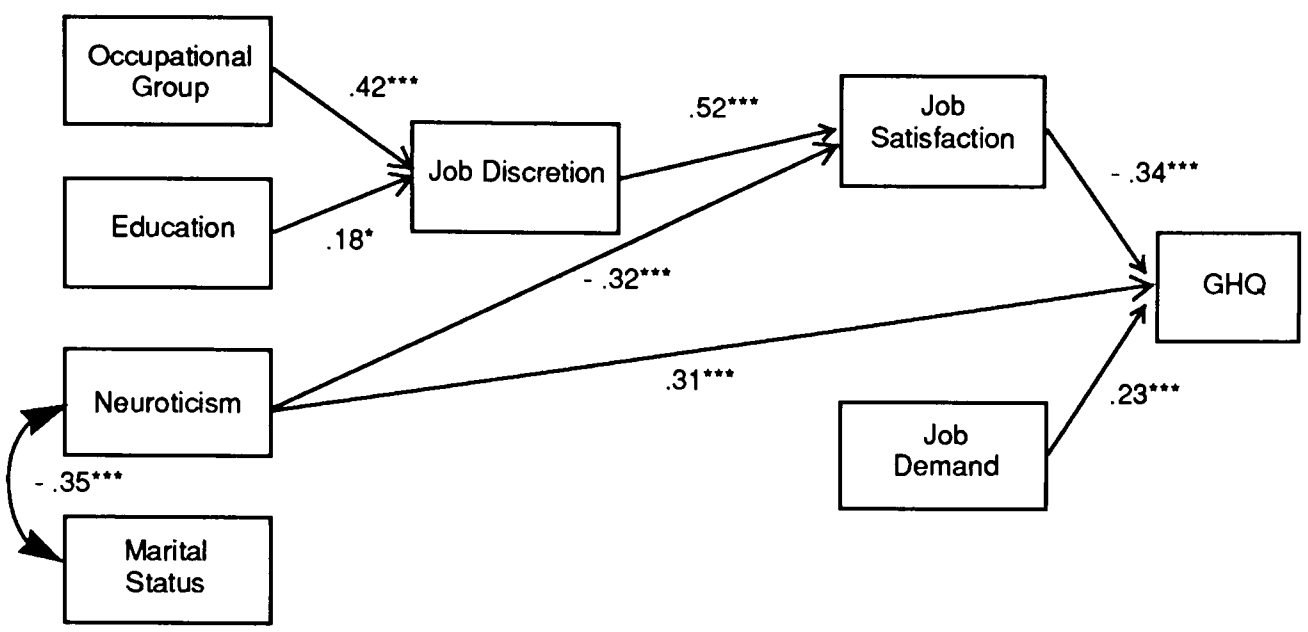
The causal model presumes that work-related stressors, operationalised as perceived job demands, job discretion and social support, lead to job satisfaction and psychological well-being (GHQ). The exogenous variables, age, gender, marital status, educational background, neuroticism, extraversion and locus of control are hypothesized to be causally connected to the work stressors and outcome variables. Path analysis was used to test the hypothesized causal processes linking the stages shown in the model.

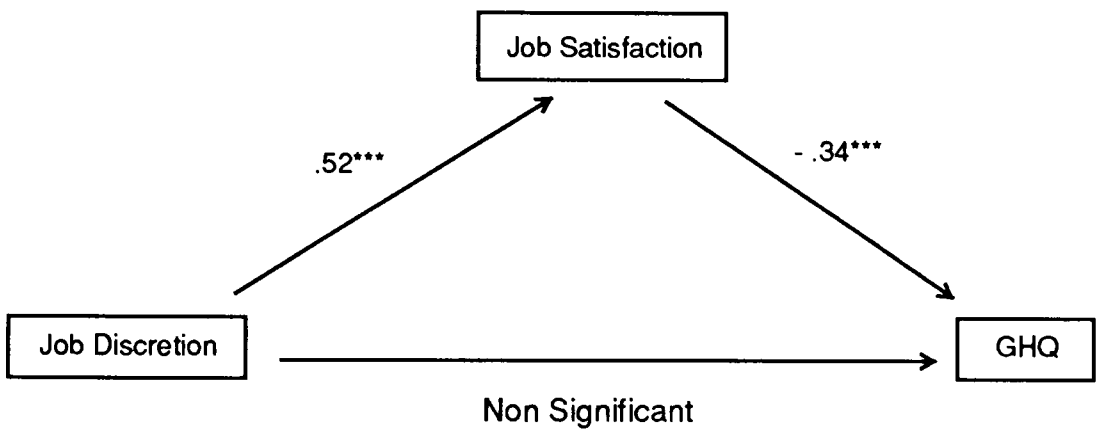
Each endogenous variable was regressed on all the others that preceded it. Five separate equations were determined for the dependent variables specified in the causal model. Standardized beta weights were used to estimate the path coefficients. The zero order correlations for the variables shown in the path model were discussed earlier in the regression analyses on job satisfaction and the GHQ. Some of the variables which did not reach statistical significance at the .05 level were dropped in the second analysis in which the remaining variables in the model was tested. The significant path coefficients are shown in Figure 4.10.

Job discretion did not predict GHQ when job satisfaction was included in the regression. However, when job satisfaction was dropped from the regression, job discretion was significant at $p = 0.014$, $\beta = -.20$. This finding is consistent with criteria which define when a variable functions as a mediator (Baron and Kenny, 1986). The (three-variable) path diagram in Figure 4.10 corresponds to the mediational model discussed by Baron and Kenny. Thus, job satisfaction has a strong mediating effect on the relationship between job discretion and GHQ, rendering the predictive value of job discretion non significant in its presence.

A final analysis was carried out on a "trimmed" model comprising only five variables: GHQ, job satisfaction, perceived job demand, job discretion and neuroticism. The path coefficients were re-calculated by regressing each endogenous variable on only those antecedent variables that were presumed to have direct paths leading to it. The results

Figure 4.10 Path Analysis Showing the Effects of Antecedent Variables on Job Satisfaction and GHQ





Results of path analysis indicating mediating effect of Job Satisfaction.

☛ Occupational group, education, neuroticism, and marital status are exogenous variables in the model. The -.35 value for neuroticism and marital status is a correlation coefficient value. Marital status was coded 0 for single and 1 for married subjects.

showed a similar pattern except that all the path coefficients, estimated from the standardized beta weights from the multiple regression procedures, were stronger.

4.7 Discussion

4.7.1 Occupational Differences: Employees and Entrepreneurs

The term entrepreneur is broadly defined in this study and refers to subjects who have been in business for a period of not less than a year and who are solely responsible for the firm's success (cf. Schumpeter, 1965; Kets de Vries, 1980). Other investigators have used somewhat different definitions and while it is debatable whether the present data is comparable with other studies because of the different criteria in defining entrepreneurship, a number of interesting points nevertheless emerged. Achievement motivation, one of the distinguishing attitudinal factors ascribed to entrepreneurs (McClelland, 1961; Litzinger, 1965), significantly discriminated the employee group from the self-employed and small-business individuals, with the entrepreneur group showing higher positive nAch ("hopes for success") and lower negative nAch ("fear of failure"). While some studies have reported a positive relationship between internal locus of control and entrepreneurship (Ahmed, 1985; Pandy and Tewary, 1979), this association was only marginally significant ($p \leq 0.06$) in the present sample. Higher levels of job demand, longer work hours and less time for leisure activities appear to be characteristic of those who are responsible for their own success. The scores for perceived job demand followed a similar trend with employees reporting the lowest levels of the three groups. In particular, small business owners tended to work much longer hours (mean=57.2) than their self-employed counterparts (mean=50.2) with employees averaging the standard 40-hour week. This finding corroborates the GHS data and is consistent with results from a more recent study (Gill, 1985) which found that small business owners, especially males, report a very long working week.

The present study found no significant differences between the self-employed, small business, and employee groups with regard to psychological well-being. This absence of occupational differences in symptomatology was also reflected in the GHS data

which showed that, overall, those who work for themselves are more likely to say that their health is "good" compared to their employee counterparts. There is no information in the GHS data set which may explain why this is so. It might be, as the results from the present study suggest, that the negative aspects of work demands are offset by a generally greater degree of job autonomy and job satisfaction for the small enterprise subjects, reflected in the scores for these two measures among the three occupational groups.

In general, women small business owners and self-employed are much more likely to report ill health than either male business owners and self-employed or employees (GHS data). This pattern was not evident in the present study. However, the sample breakdown resulted in very small cells of female self-employed (n=3, 5.8%) and small business subjects (n=8, 15.4%) with which to carry out any meaningful analysis in relation to gender differences in GHQ scores between these two occupational groups.

4.7.2 Personality Factors and Social Support

One objective of the present study was concerned with the question, "*What personality factors, if any, influence the experience of available support resources?*" The results indicate that extraversion, locus of control, and need achievement jointly predict perceptions of social support.

The interactions between locus of control and extraversion, locus of control and nAch, and extraversion and nAch made significant contributions to the explained variance in the model. "Extraversion-internal LOC", "extraversion-high nAch", and "internal LOC-low nAch" were found to have positive effects on perceived support. "Introversion-external LOC", "introversion-high nAch", and "high nAch-external LOC" were associated with lower levels of support. The data demonstrate that extraversion and internal locus of control showed the strongest positive impact on perceived support since each of these

personality factors combined with nAch (see Figure 4.2, 4.3, and 4.4) reveal consistently higher levels of social support.

One interpretation of this finding is that people are attracted to extraverts and therefore more inclined to help them because of their lively, outgoing, social behaviour and attitudes towards others. Internals generally believe that rewards and satisfactions are a result of their ability and efforts, and are likely to seek and use information more actively than externals. This control belief, coupled with extraversion, could explain why significantly greater amounts of perceived support are associated with "extravert-internal" subjects. The issue of whether extraverts and internals actually receive more support, or perceive the same support as greater needs to be addressed. One potentially fruitful area for further work is to investigate whether perceptions of support among extraverts and internals actually reflect their social support systems, if they are more skilled at constructing a better network of supportive relationships, and if they receive more help than, say, introverts and externals when distressed.

Alternatively, internal-introverts could muster support by simply being "controlling", that is, by exerting their personal influence over others in social interactions. It is likely that high achievers i.e. individuals who seek to perform well, show strong motives to succeed, and respond more positively to demanding and challenging situations (Locke and Henne, 1986), also attract support because of the social value of their positive attitudes and behaviour. Thus, high nAch+ve and extraversion interact to effect a positive influence on social support.

Some theorists have argued that emotional support is a requisite for well-being, irrespective of stressors because of the presumed human need for attachment. The ISEL measure taps emotional support - behaviour that fosters feelings of comfort that leads an individual to believe that he or she is admired, respected and loved) through its appraisal and belonging subscales. Social relationships provide many of the esteem, belonging, and

nurturing needs. Undoubtedly, personality dispositions affect one's readiness to seek help from others, the need for sociable and intimate interaction and the responses to feedback from others. Caldwell and Reinhart (1988), for instance, demonstrated the relationships between self-esteem and emotional support. In their study, individuals with high self-esteem tended to elicit and receive more emotional support than those who scored lower on a self-esteem scale. The results from the present study confirm this perspective and provide evidence that suggests individual differences play a role in the utilization of support resources. It also offers an explanation for the finding that support from different sources often have differential effects on the recipient.

On a theoretical basis, the transactional view states that stress arises when (perceived) demands exceed (perceived) resources, emphasizing the role of cognitive appraisal in its formulation. This appraisal process is also of primary importance in the conceptualization of social support, particularly where functional measures such as the ISEL are concerned. Thus, appraisal is the common link underlying the experience of stress as well as social support. Although the cross-sectional design of the present study limit the conclusions that can be drawn concerning causal relationships, one inference is that the personality factors interact to influence the appraisal of supportive relationships, which in turn moderate the deleterious effects of work stressors on health.

It will be seen in the next section that if social support moderates work stress, and given that perceived support is conditioned by a combination of personality dispositions, this might suggest that future research should give more attention to the role of individual differences in the study of social support.

4.7.3 Social Support and the Buffering Hypothesis

The results from the present study demonstrate that social support enhances well-being by moderating the effects of work stressors. However, the ISEL measure and each of the House support measures showed different buffering effects on work stressors.

First, the regression analysis of GHQ scores demonstrated a monotonic interaction for overall social support (ISEL) x stress (Job Discretion). This interaction showed a strong buffering effect in that support totally ameliorated the effect of stress on GHQ. High social support individuals were little affected by decrements in job discretion. For those with low support, low discretion was significantly associated with higher levels of GHQ scores. There was no main effect of support on psychological health.

In examining the House support measures on GHQ, analyses of the data revealed a stress-buffering effect of support from friends on job demands. However, contrary to prediction and current theoretical formulations, this buffering effect made the relationship between stressor and symptoms stronger rather than weaker. Specifically, this negative moderating effect was evident for levels of perceived demand which increased from the mean. Apart from three recent studies which found negative moderating effects (Ganster, Fusilier and Mayes, 1986; Kaufmann and Beehr, 1986; 1989), reverse buffering are not often reported in the work stress literature.

Two potential explanations can be offered in accounting for this reverse buffering effect of social support. One interpretation is that "*supportive others may sometimes convince us that job conditions are not as bad as they seem, whereas at other times they may help us to see that they are as bad as or even worse than we thought (what might be termed 'negative buffering')*" (LaRocco, House, and French, 1980; p. 214). Thus, the support communicated (by friends) could have taken a negative form, especially under conditions of high distress. When the level of the stressor is relatively low, support from

friends operate in the generally predicted direction, that is, they demonstrate ameliorative effects. Another possibility is that the House support measure is worded to emphasize difficulties at work and asks how much help each of the four potential sources of support can provide (*e.g "If you were to run into difficulties or problems at work, how helpful do you think the following people will be?"*). It might be that friends and relatives not only do not give effective assistance but aggravate the situation because they do not understand or relate to the individual's (work) problems.

Alternatively, the reverse buffering effect may be due to a mismatch of support (type or source) with the needs of the individual. Most social support investigations follow a research framework which assume that the causal flow of events is from stressor to strain. A further implicit assumption of many of these studies is that the recipient is usually "non-responsive" to the support. Thus, investigators have often examined the source and nature of social supports to determine their effects on the job stressor and strain levels of what is assumed to be a passive recipient. However, current theories of stress, and in particular work stress, emphasize the interaction between the person and the environment, in which people adapt to environmental stressors by selecting appropriate coping strategies. Thus, it may be that subjects in the present study seek support from friends rather than colleagues at work when it is in fact the latter source of support which may be most relevant and helpful under conditions of high job demands.

Second, supervisor and coworker support did not moderate work-related demands in relation to GHQ although coworker support showed significant buffering effects in relation to job satisfaction. No main or interactive effects of global support (ISEL) on job satisfaction were found. These results suggest that supervisor and coworker support are specific to the work context and therefore play a less significant role, compared with global support, in alleviating the experience of stressful situations outside the work environment. This finding corroborates the "need-specificity" hypothesis proposed by Cohen and Wills

(1985) which predicts that in order to get a significant stress moderating effect, there must be a match between the needs elicited by a stressor and the available support resource. Further, the buffering effect is strongest when support match needs. The use of two independent support measures, a global support scale (non-work), and an adaptation of the House measure which assesses both work and non-work support dimensions allows for a more rigorous examination of Cohen and Will's "need-specificity" hypothesis, strengthening the validity of the findings since three different types of support measures were tested on work-related outcomes.

Main effects of psychological job demand and job discretion were present but there was no evidence of demand and control interaction in the prediction of job strain and well-being. The empirical literature generally indicates that high levels of perceived job control (or job discretion) have been found to be associated with high levels of job satisfaction, commitment, performance and with low levels of somatic symptoms and general physical and mental health (Spector, 1986). These relationships were replicated in the present study. There is, however, less consensus concerning support for the demand-control interaction model of work stress as some studies have found evidence for the model whereas others have reported no interactive effects. Some of the reasons for these discrepancies were discussed by Parkes (1989). It appears that, in the present study, the interaction between demand and control was not sufficiently robust to be significant, perhaps because of the wide range of jobs studied in this general population sample.

Finally, the results from the path analysis of the model depicting the causal relationships between work environment, demographic variables, job satisfaction and GHQ suggest that job satisfaction functions as a mediator in the stress-health relationship. Job discretion was nonsignificant in predicting GHQ in the presence of job satisfaction; there was no "path" linking it to GHQ (Figure 4.10). However, in the absence of job satisfaction in the regression, job discretion was significant at $p \leq .01$. Consistent with current research,

this suggests that job satisfaction (or dissatisfaction) appears to be a more immediate response to work-related stressors than physical or psychological ill health (Kahn, 1980; Jackson, 1983).

Chapter Five

Transition from Education to Work: A Longitudinal Study

Summary

This chapter describes a longitudinal field study which investigated relationships between social support, individual differences and responses to work demands among a group of university graduates. While the general theme of this investigation is similar to that of the study reported in Chapter 4, the research described here focused on the transition from education to work and its effects on psychological well-being. The first assessment took place about four weeks after subjects started work and the follow-up was carried out about six months later. Analysis of the data revealed significant changes in the overall level of perceived work demands, work social support and mental health between Time 1 and Time 2.

The results replicated the findings of the previous study (Chapter 4) in that social support, particularly from work sources, moderated the harmful effects of job-related stressors. In addition, the results suggested that the beneficial effects of social relationships in mitigating stress depend partly on the timing and matching of "needs" with the relevant supportive aid. The study also found evidence for the role of individual differences as moderators of the relationship between stress and health. Locus of control and individual preferences for particular types of work or work environment moderated the effects of work demands and significantly contributed to the experience of stress. Neuroticism acted as a confounding factor, inflating the strength of the relationship between psychological symptoms and perceived work demands, and also moderated the relationship between work discretion and job satisfaction. Consistent with Karasek and Johnson-Hall's models of work stress, significant two-way "demand-discretion" and three-way "demand-discretion-support" interactions were found. However, some of the three-way interactions were not in the predicted direction.

Chapter 5

5.1 Introduction

Major life transitions, such as recovery from illness, changes in interpersonal relationships, job loss, geographic relocation, and changing jobs have been found to require considerable adaptation, and to be associated with risk of physical and mental ill health (Compass, Wagner, Slavin and Vannatta, 1986; Felner, Farber and Primavera, 1983; West, Nicholson and Rees, 1987). Starting work is one life transition that can be highly stressful. There is evidence to suggest that the first few months of employment constitute a critical period for new job entrants as they seek to understand their new environment, to establish a sense of belonging and security, and to find opportunities to develop their skills and prove their worth (Arnold, 1985, 1986; West and Newton, 1983). Apart from immediate job stresses, new employees are also likely to be concerned with their future careers, with relationships with work colleagues, and with whether their jobs will fulfil personal motivations such as the need for achievement, challenge, or social interaction. Thus, a combination of personal, social and situational factors determine how well new workers adjust and cope with their new work roles.

The importance of social resources in facilitating major life transitions has been well-documented outside the occupational sphere, particularly in life events research. Although the significance of social support as a potential stress moderating factor has been recognised in the context of work transitions (e.g. Arnold, 1986), less attention has been given to empirical studies of social support among young people starting work and its implications for well-being. Most of the research on work transitions has tended to focus on the individual's attitudes and behaviour toward their new environment (Bazalgette, 1975), on how they are integrated into the work organization (Mowday, Porter and Steers, 1981), and on the surprises they experience during the first months of employment (Arnold, 1985). These studies have stimulated much interest but investigators have tended to explore

personal experiences rather than the interactive effects of psychosocial and work factors in determining responses to the work environment.

Thus, empirical studies of new job entrants merit further research attention. Furthermore, this group provides a unique basis for the study of stress because much of what is currently known about the effects of occupational health and work stress have come from investigations of established employees, who have been exposed to demands of the workplace for a considerable period prior to data collection, rather than from new recruits. One advantage of using a cohort of new workers is that it enables more reliable, "true" initial baselines for predictor and criterion variables to be established. In particular, if subjects are assessed before they enter work, it can be assumed that initial levels of psychological health will not be influenced by the occupational stressors concerned since they would not have previously been exposed to the work situation.

In contrast, the study described in Chapter 4 was carried out among a group of small business enterprise owners and employees who were predominantly those of an older group of workers with several years experience in their current jobs. The study found some evidence that individual differences in personality were related to perceived social support. There was also evidence that social support moderated the relations between work demands and psychological health. Although the nature and direction of causal relationships could not be established because of the cross-sectional nature of the research, the findings nevertheless provide a useful basis for further study of the effects of occupational stress on health among those starting work. In order to strengthen the validity of the inferences, longitudinal investigations which directly examine the process of adaptation to changes in the work environment are needed.

The present work therefore used a prospective research design in further investigating the relationships between individual differences, social support and responses to work stress among a group of recent graduates during their first year of employment.

Such an approach has the advantage that it allows examination of the effects of changes occurring in the work environment over a period of time. The objectives of the present study were: (i) to replicate and extend, in longitudinal data, previous findings concerning the buffering role of social support; (ii) to examine the role of individual differences in mediating the relationship between work stress and psychological health; (iii) to test the Karasek demand-control model of work stress; (iv) to test the Johnson and Hall demand-control-support model to determine what combinations of job characteristics and social support predict high and low risks to psychological health.

(i) Social Support as Moderators of Work Stress

The literature review in Chapter 2 noted the controversy surrounding the main versus stress-buffering role of social support in stress research. One of the reasons for the lack of more convincing evidence for the buffering effect hypothesis is that most of the research are retrospective studies. Only a minority of all findings is based on longitudinal designs and more often than not, these are epidemiological investigations dealing with social integration. The present study therefore aims to examine in more detail the buffering effects found in the previous study (Chapter 4) and provide more substantive evidence in clarifying whether social support mitigates worker's adverse responses to high levels of work stressors, or if it is generally beneficial to health regardless of the level of distress experienced.

Recent research findings indicate that social support is a complex phenomenon requiring closer examination of its constituent elements if we are to advance our understanding of the mechanisms through which social resources influence cognition, affect, behaviour and physiological responses to stress. In particular, investigators have begun to focus their attention on the relationships between types of support and types of stressors. There was some evidence in the previous study which provided support for the "need-specificity" hypothesis put forward by Cohen and Wills. More importantly, the

temporal nature of social support is related to the matching of support resources with specific stressful situation. Lazarus and Folkman (1984) have argued that coping with stress involves different types of support at different times and reflects the continuous process of appraisal and reappraisal of the shifting demands made on the person. The significance of the timing of support has been demonstrated in some studies (e.g. Lazarus, 1985; Bowlby, 1980) and suggests that it may be a critical factor determining its effectiveness in mitigating stress particularly for those undergoing transitions. The present longitudinal research enables this aspect of social support to be examined. Relationships with work colleagues and supervisors take time to develop and this is particularly true of new employees. One of the objectives of the present study is to examine changes in levels of support over time; to evaluate what types of supportive relationships mitigate work stress effects during the initial stages of employment, and after a period of several months.

(ii) Individual Differences in the Stress-Health Relationship.

A number of personality factors have been reported to moderate stress-induced disorders. The literature review in Chapter 2 highlighted some of the personality characteristics that have been studied e.g. hardiness, Type A behaviour pattern, self-esteem. One of the personality variables likely to render some people relatively immune to stress, and others more susceptible, to impaired health is locus of control. Empirical evidence also suggests that neuroticism may act as a vulnerability factor moderating relations between work stressors and outcomes (Parkes, 1990; WatsonPennebaker & Folger, 1987; Watson, 1988).

One type of individual difference that may influence stress appraisal and response is personal preference for a particular kind of work or work environment. It is not often the case that work tasks, or the "reality" of work itself, match individual preferences in relation to fulfilling personal ambitions, achievement, and other psychosocial needs. Discrepancies between preferred work characteristics and the actual job may give rise to feelings of stress

and strain. The theoretical basis of this assumption can be found within the framework of "person-environment fit" theory, in which optimal human functioning occurs when individual abilities or resources are commensurate with the demands of the environment. Another type of "fit" theory which emphasizes control beliefs between the person and environmental conditions is found in the congruency model of control (e.g. Bazerman, 1982). Congruency refers to the degree to which control opportunities provided by environmental conditions correspond to the individual's ability to make effective use of control in determining outcomes. Two types of control states are specified; congruence and incongruence effects. Congruence describes the optimal control state which occurs when individual abilities match the control opportunities provided by the environment. Incongruence is said to exist when individual abilities are incompatible with control opportunities. The theory behind the congruency model suggests that congruence will lead to better performance and/or more favourable outcomes than incongruence effects.

The concepts from P-E fit theory and the congruency model are used as the theoretical basis for examining the role of individual differences in the stress process. The second objective of the present study was concerned with investigating individual differences in personality (e.g. locus of control, neuroticism) and work preferences in influencing responses to work-related stressors.

(iii) The Karasek Demand-Control Model of Work Stress

The Karasek model is of particular interest in the present study because work-related stressors were conceptualized in terms of Karasek's formulation of perceived job demands and job decision latitude. It was noted in Chapter 1 that a number of studies have not found evidence for the predictions made by the two-dimensional model. Furthermore, research which does report significant interactions between job demand and decision latitude in relation to health outcomes has been published mainly by Karasek and his

colleagues. The present study therefore aims to test the predictions made by the demand-control model (Chapter 1, Section 1.3.2) in relation to psychological well-being.

(iv) The Demand-Control-Support Model of Work Stress

Johnson and Hall suggested that the demand-control model of work stress formulated by Karasek should be extended to include social support as a third dimension of the work environment. In a cross-sectional study which partially supported their predictions, they demonstrated high cardiovascular disease rates among workers who reported high job demand, low discretion and low social support. The question arises as to whether the extended demand-control-support model also applies to mental health outcomes. One aim of the present work is to test this extended model of work stress.

5.2 Method

Subjects and procedure

The participants were students who had graduated from the University of Oxford in the summer, 1988. 980 students were initially contacted in June 1988, by letter, from a list provided by the Oxford University Appointments Committee. 248 students (response rate, 25.3%) indicated their interest in the proposed longitudinal study. A questionnaire was sent to all prospective participants in October and 164 responses (66.1%) were received by January 1989. 27 persons indicated that they would not be working until later in the year, leaving a sample of 137 subjects.

The second part of the research was carried out in the Spring of 1989 and 121 completed responses (follow-up response rate, 88.3%) were received by June. The interval between Time 1 and Time 2 assessments was 6.87 months (*sd*=0.82). Participants had been working for about eight months at the follow-up assessment.

5.3 Assessment of Variables

The psychometric properties of the key measures used in the present study are described in Chapter 3. Questionnaire measures which are specific to the present investigation are reported in subsequent sections in this Chapter. A list of all the measures used in the present study can be found in Appendix 2 and 3.

Measures: Time 1

Individual Information. Demographic information concerning gender, age, marital status, class of degree, previous work experience and length of time since starting work was obtained. In addition to this background information, four personality traits were assessed in this study.

Personality Characteristics. Trait neuroticism and extraversion were measured by means of the 24-item Eysenck Personality Questionnaire (EPQ). The trait neuroticism measure also reflects the construct of negative affectivity (Watson and Clark, 1984) which has been hypothesized to be a major determinant of reports of affective states and perceptions of environmental circumstances. Two dimensions of locus of control, personal efficacy and Interpersonal locus of control were assessed using the Paulhus Sphere of Control scale.

A modified version of a questionnaire measure of work preference (Parkes, 1986, personal communication) was included in the present study. This questionnaire was administered on both the Time 1 and Time 2 assessments with different instructions on each occasion. At the Time 1 assessment, subjects were asked how important each of the job characteristics described in the work preferences questionnaire were to them, regardless of their actual work situation.

Work Variables. As in the entrepreneur study, perceived job demand, job discretion, and social support were measured by means of the Karasek questionnaire and the House social support scale.

Job Satisfaction and Health Outcome. Three items which asked about subjects' feelings concerning their work situation were used to assess job satisfaction. A total score was calculated by summing the scores from the three items. Psychological well-being was measured using the short 12-item version of the Goldberg General Health Questionnaire (GHQ). A seven item social dysfunction subscale taken from the scaled version of the GHQ (Goldberg and Hillier, 1979) was also included. The social dysfunction measure reflects feelings of social inadequacy, indifference, low morale, and lack of interest. This subscale of the GHQ was chosen because it was thought that it might tap specific symptoms relevant to work adaptation which would not be detected by the general GHQ measure.

(ii) Measures: Time 2

Apart from the demographic and personality trait factors, the Time 2 measures included all of the work and outcome variables listed above as well as the work preferences questionnaire (WPQ). The second administration of the WPQ was carried out with a different set of instructions. Subjects were asked to indicate the extent to which the questionnaire items described their current work situation.

5.4 Statistical Treatment

Multiple regression was the main statistical technique used. The procedures and merits of this technique were discussed under the methods section in Chapter 4. The data analysis was carried out in three parts.

Part 1- Descriptive Data Analysis

The first part consisted of the usual data-screening procedures to check for errors in data-entry and to obtain a description of the sample. Reliability measures of psychometric scales and zero order correlation matrices for key variables were computed using the relevant SPSSx procedures. These variables were also tested for normality of distribution.

Part 2 - Separate Analyses of Time 1 and Time 2 Data

One of the aims of the present investigation was to replicate the moderating effects of social support found in the study of entrepreneurs and employees. The second part of the analysis was therefore concerned with examining the additive and interactive effects for each of the measures of social support in relation to mental well-being at each time point. The unique contribution of each subset of independent variables (demographic characteristics and work factors) in predicting mental health was assessed independently of each other and simultaneously as a group. Predicted within-level (e.g job demand x job discretion) and across-level interactions (e.g. gender x demand) were entered after the main

terms had been included in the regression, in accordance with the recommended procedures (see Cohen and Cohen 1983). An outline of the steps used in the regressions of cross-sectional Time 1and Time 2 data is given in Table 5.1.

Table 5.1 General Approach for Analysis of Cross-Sectional Time 1 and Time 2 Data

Dependent Variable:

(i) GHQ12
(ii) Job Satisfaction

Independent or Predictor Variables

Stage 1: Demographic Variables

+ Age, Gender, Marital Status, Education, Period At Work

Stage 2: Work and Social Support Measures (Time 1 or Time 2)

+ Psychological Job Demand, Job Discretion, Social Support

Stage 3: Interaction Terms (Time 1 or Time 2)

+ Job Demand x Job Discretion
  Social Support x Job Demand
  Social Support x Job Discretion

+ Social Support x Job Demand x Job Discretion

(+) Indicates a new step in the regression.

Dependent variable indicates separate regression analyses for GHQ and Job Satisfaction.

☛ "Period at work" refers to length of time subjects had been working since leaving university at the Time 1 or Time 2 assessment.

Chapter 5

Part 3 - Longitudinal Analysis: Time 1 with Time 2 Measures

The third part of the analysis examined concurrent changes between Time 1 and Time 2 personal, social and work variables in the prediction of job and health outcome. Although cross-sectional analysis of Time 1 and Time 2 measures are useful sources of information, the longitudinal data allow for more rigorous examination of the relationships among the variables of concern in the present research. Thus, the main focus of the statistical analysis was to evaluate the relations between changes in work demands and social support and changes in personal functioning over time. The contribution of work, social and personal resources at Time 1 in predicting Time 2 health outcome was also evaluated.

A number of techniques are available for the analysis of longitudinal data (see Asher, 1976; Kenny, 1979) but regression analysis was chosen because it has the advantage of allowing evaluation of the relative importance of different predictive relationships between variables. Moreover, some investigators have pointed out that the measurement of change is subject to a number of statistical problems such as the correlation of "raw change" scores (obtained by taking differences between Time 1 and Time 2 testing) with random error of measurements at initial testing, and the general unreliability of difference scores (Cronbach and Furby, 1970; Linn and Slinde, 1977). Following Cronbach and Furby's recommendation, a hierarchical multiple regression framework was used to examine concurrent changes across different time domains. Table 5.2 shows an example of a regression model used in the analysis.

Table 5.2 Outline of Regression for Analysis of Longitudinal Data

Dependent Variable:

(i) GHQ12
(ii) Job Satisfaction

Independent or Predictor Variables

Stage 1: Demographic Variables

+ Age, Gender, Marital Status, Education, Period At Work☛

Stage 2: Time 1 Variables

+ Time 1 outcome (either GHQ12, or, Job Satisfaction).
  Psychological Job Demand, Job Discretion, Social Support

Stage 3: Time 2 Variables

+ Psychological Job Demand, Job Discretion, Social Support
+ Cross-Product Terms - Time 2 Variables
  Job Demand x Job Discretion
  Social Support x Job Demand
  Social Support x Job Discretion
+ Social Support x Job Demand x Job Discretion

(+) Indicates a new step in the regression.

Dependent variable indicates separate regression analyses for GHQ and Job Satisfaction.

☛ "Period at work" refers to length of time subjects had been working since leaving university at the Time 1 or Time 2 assessment.

Time 2 social support, job demand and job discretion were used to predict psychological well-being (GHQ) at Time 2 while controlling for GHQ, job demand, job discretion and social support at Time 1. All the independent terms were reduced to zero means. The analysis also incorporated a control for neuroticism in the light of findings which suggest that neuroticism tends to inflate the relationships between self-report measures of work stress and psychological symptoms (Brief, Robinson and Webster, 1988; Watson and Pennebaker, 1989; Parkes, 1990).

5.5 Results

Sample Description

The majority of the subjects were single (96.7%, *n*=117); 62.8% were male (*n*=76) and 37.2% were female (*n*=45). The mean age was 22.03 years (*sd*=2.00) and subjects had been working, on average, 1.27 months (*sd*=0.66) when they completed the questionnaire at the first assessment period. 22 subjects (18.2%) reported having some full-time working experience before beginning their undergraduate studies at Oxford. The sample generally showed a high level of educational achievement with 23.1% (*n*=28) of subjects obtaining first class degrees and 44.6% (*n*=54) obtaining 2nd class (upper) honours in their examination results. 72.7% (*n*=88) of subjects were employed in the private sector, 27.3% (*n*=33) in local government, the civil service, hospitals, and universities. The most frequently reported occupations were in finance and banking (19%), business management services (24%) and engineering (8.3%). The number of staff in the departments in which subjects worked ranged from 2 to 150 (mean=36.18, *sd*=37.77).

At the second assessment, 44[7] persons (36.4%) reported major changes relating to their work e.g. relocation to another branch of the organization in a different part of the country, transfer or attachment to another department, new supervisor or boss. Nine of the 44 subjects indicated that they had moved to new jobs. The analyses reported in subsequent sections were based on complete data obtained from Time 1 and Time 2 cases (*n*=121).

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7. A *t*-test of means between subjects in this group (*n*=44) and those who reported no major changes in their work (*n*=77) showed no significant differences in work-related demands, social support, job satisfaction, and GHQ.

Chapter 5

Order of Presentation of Analyses

The results reported in the following sections are concerned with: (A) changes in levels of work environment and health outcome measures; (B) cross-sectional analysis of Time 1and Time 2 data; (C) longitudinal analysis, taking into account concurrent changes in work factors and health outcome between Time 1 and Time 2. Two multiple regression approaches were used for the analyses carried out in (B) and (C); a comprehensive regression model in which all the work and social support variables were included as predictors of GHQ and job satisfaction, and separate analyses of individual social support measures in the prediction of the criterion variables. The role of trait neuroticism as a potential source of inflationary bias underlying stress-health relationships was also evaluated. The order of presentation is shown below:

A. Analysis of changes in work, personality, social support and health outcomes between Time 1 and Time 2.

B. Cross-sectional (regression) analysis of Time 1 and Time 2 data.

   (i) Prediction of psychological health (GHQ12)

   Omnibus Regression Model - All support components included.
   Regression analyses including only single components of social support.

   (ii) Prediction of job satisfaction

   Omnibus Regression Model - All support components included.
   Regression analyses including only single components of social support.

C. Longitudinal (regression) analysis, Time 1 and Time 2 data.

   (i) Prediction of psychological health (GHQ12)

   Omnibus Regression Model - All support components included.
   Regression analyses including only single components of social support.

   (ii) Prediction of job satisfaction

   Omnibus Regression Model - All support components included.
   Regression analyses including only single components of social support.

5.5.1 Changes In Work Demands, Social Support and Health-Related Outcomes Between Time 1 and Time 2.

The "across-time" stability of each measure was calculated by a Pearson correlation coefficient. The means, standard deviations and stability coefficients of the personality, work and outcome measures (Time 1 Time 2 data) are given in Table 5.3. and Table 5.4.

Table 5.3 Person Correlation Coefficients, Means, and Standard Deviations of Measures Between Time 1 and Time 2 Assessments for Males (N=76) and Females (N=45)

Variable	Stability Coeff.	Time 1 M	Time 1 SD	Time 2 M	Time 2 SD	t Value
MALES						
Work Measures						
1. Hours work per week	.724***	42.41	7.168	43.20	8.68	- 1.12
2. Job Discretion	.685***	23.68	5.23	23.20	4.71	1.07
3. Job Demand	.603***	17.22	4.23	17.41	4.40	*ns*
4. Support - Boss	.704***	16.55	4.38	15.61	4.45	2.39**
5. Support - Coworker	.514***	9.81	2.66	9.91	2.42	*ns*
6. Support - Spouse/partner	.286***	5.62	4.57	6.60	4.53	- 1.67
7. Support - Friends/relations	.503***	9.31	2.79	8.58	2.80	2.25*
Outcome Measures						
8. Job satisfaction (total)	.526***	11.91	2.58	10.62	3.36	3.78***
9. Self-reported health	.460***	3.04	0.79	2.91	0.93	1.28
10. GHQ12	.518***	8.84	4.27	10.34	4.38	- 3.08***
11. GHQ Social Dysfunction	.353***	5.71	2.75	6.24	2.34	- 1.57
FEMALES						
Work Measures						
1. Hours work per week	.633***	40.13	7.49	41.89	7.88	- 1.78
2. Job Discretion	.685***	21.44	5.30	19.75	6.10	2.12*
3. Job Demand	.421***	17.29	5.30	16.04	4.34	- 1.84†
4. Support - Boss	.468***	16.69	4.11	15.16	5.12	1.83†
5. Support - Coworkers	.473***	9.82	2.11	9.07	2.42	- 1.87†
6. Support - Spouse/partner	.641***	7.07	4.72	8.11	4.82	- 1.73
7. Support - Friends/relations	.453***	10.18	2.86	9.78	3.14	*ns*
Outcome Measures						
8. Job satisfaction (total)	.471***	11.47	2.89	9.82	3.49	2.94***
9. Self-reported health	.454***	2.89	0.83	2.58	1.08	2.05*
10. GHQ12	.458***	11.73	5.87	12.64	6.36	*ns*
11. GHQ Social Dysfunction	.294*	6.76	2.95	7.51	3.47	- 1.57

†$p \leq 0.07$. *$p \leq .05$. **$p \leq 0.025$. ***$p \leq 0.01$.

Table 5.4 Summary Statistics for Personality, Work and Outcome Measures by Gender

	Female			Male			
Variable	N	M	SD	N	M	SD	t Value
1. Extraversion	45	8.13	3.31	75	7.39	2.99	*ns*
1. Neuroticism	45	5.29	2.85	75	3.75	2.22	2.89***
3. Interpersonal LOC	45	49.04	8.67	76	48.25	8.10	*ns*
4. Personal Efficacy	45	50.89	5.49	76	51.18	6.88	*ns*
5. Job Demand $Time_1$	45	17.29	4.09	76	17.22	4.29	*ns*
6. Job Demand $Time_2$	45	16.04	4.34	76	17.41	4.40	*ns*
7. Job Discretion $Time_1$	45	21.44	5.30	76	23.68	5.23	2.27**
8. Job Discretion $Time_2$	45	19.75	6.11	76	23.19	4.71	3.47***
9. Job Satisfaction $Time_1$	45	11.47	2.89	76	11.91	2.58	*ns*
10. Job Satisfaction $Time_2$	45	9.82	3.49	76	10.62	3.36	*ns*
11. Social Dysfunction $Time_1$	45	6.76	2.95	76	5.71	2.75	1.97*
12. Social Dysfunction $Time_2$	45	7.51	3.47	76	6.24	2.35	2.41**
13. GHQ $Time_1$	45	11.73	5.87	76	8.84	4.27	3.12***
14. GHQ $Time_2$	45	12.64	6.36	76	10.34	4.38	2.35***

*$p \leq 0.05$. **$p \leq 0.025$. ***$p \leq 0.01$.

A t-test for pairs was used to assess the direction and significance of the changes that occurred between the two assessment periods. Except for social dysfunction (females), the stability coefficients (r_s) for all of the variables were statistically significant at $p \leq .01$. However, an r value of say, 0.5, represents only 25% common variance; thus a major part of the variance in Time 2 measures was not accounted for by the corresponding Time 1 measures, that is, by stability across time. The results also revealed gender differences (Table 5.4). In particular, women reported significantly lower levels of job discretion ($p \leq$ .025 - Time 1; $p \leq .01$ - Time 2), higher GHQ and social dysfunction, and higher neuroticism, as compared with men.

Separate analysis of the work and outcome measures for males and females showed highly significant differences in work satisfaction and GHQ scores for men ($p \leq .01$) between Time 1 and Time 2 although job demand and job discretion remained relatively stable (Table 5.4). Supervisor support also decreased. In contrast, there were no significant

changes in GHQ for women over the two assessment periods but a general trend toward lower job discretion, work satisfaction and self-reported health was evident at Time 2; job demand and supervisor and coworker support also decreased marginally. In addition, subjects reported a higher frequency of physical exercise and active leisure during their undergraduate studies compared with beginning work at Time 1, and six months later at Time 2 [$t(1,75)=4.93$, $p \leq .001$, males; $t(1,44)=2.26$, $p = .029$, females].

5.5.2 Cross-Sectional Analysis of Time 1 and Time 2 Data

Table 5.5 shows the means, standard deviations and intercorrelations of the work, social support and outcome measures for Time 1 and Time 2. Job demand did not correlate with either GHQ or job satisfaction but job discretion showed the expected inverse relationship with GHQ, the relationships being more marked at Time 2.

The correlations among the social support items are of particular interest. The Time 1 data shows that supervisor and coworker support were correlated with each other but not with either partner/spouse or friends/relatives support. This trend was replicated in the Time 2 analysis. Both the Time 1 spouse/partner and friends/relatives support measures were highly positively correlated with their Time 2 counterparts (r=.46, r=.50, respectively). Time 1 supervisor support showed an inverse relationship with Time 1 GHQ, but was positively related with Time 1 job satisfaction and Time 2 supervisor and coworker support. Time 2 supervisor and coworker support were inversely related with Time 1 and Time 2 GHQ. The work support scores in the second assessment showed stronger associations with health at Time 2 than in the initial testing period. This shift in the correlational pattern might suggest that, over time, work relationships assume a more significant role in the stress-health relationship as subjects develop and establish their network of supportive others in the work setting. Increasing work demands at Time 2 are associated with increasing needs for helpful colleagues and supervisors, one way in which people cope with difficulties arising from the work situation. On the whole, the

Table 5. 5 Means, SDs, & Pearson Intercorrelations of Time 1, Time 2 Work, Social Support & Outcome Measures, Oxford Graduates Data

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Mean	9.92	6.10	11.74	17.25	22.85	16.61	9.82	6.17	9.64	11.20	6.71	10.32	16.91	21.92	15.36	9.57	7.21	9.09
S.D.	5.10	2.88	2.69	4.20	5.34	4.26	2.46	4.37	2.84	5.30	2.87	3.42	4.40	5.51	4.76	2.64	4.52	2.99
1. GHQ T_1	(.83)																	
2. GHQ s.Dysfunction T_1	.72**	(.68)																
3. Job Satisfaction T_1	-.46**	-.47**	(.89)															
4. Job Demand T_1	-.02	-.15	-.15*	(.83)														
5. Job Discretion T_1	-.25**	-.27**	.61**	.27**	(.87)													
6. Support-Boss T_1	-.30**	-.18*	.32**	-.09	-.21**	(.87)												
7. Support-Coworker T_1	- .10	-.12	.20	-.08	.11	.38	(.78)											
8. Support-Partner T_1	-.02	-.12	.14	.14	.12	.03	-.03	(.93)										
9. Support-Friends T_1	-.05	-.04	.13	.11	.04	.08	-.04	.13	(.67)									
10. GHQ Time T_2	.43**	-.22**	-.22**	.06	-.16	-.05	-.05	-.04	-.05	(.84)								
11. GHQ s.Dysfunction T_2	.37**	.24**	- .16*	-.08	-.10	-.05	-.02	.11	.03	-.51**	(.74)							
12. Job Satisfaction T_2	-.32**	-.29**	.45**	.05	.32**	.17*	.11	-.01	.16*	-.52**	-.48**	(.89)						
13. Job Demand T_2	-.05	-.10	.16*	.53**	.15*	-.01	-.02	.02	.09	.11	-.17*	.15*	(.86)					
14. Job Discretion T_2	-.29**	-.25**	.39**	.11	.65**	.10	.05	.04	.01	-.34**	-.36**	.56**	.21**	(.81)				
15. Support-Boss T_2	-.29**	-.09	.29**	-.09	.21**	.53**	.35**	-.07	.02	-.30**	-.23**	.41**	.03	.23**	(.88)			
16. Support-Coworker T_2	-.18*	-.05	.23**	-.11	.15*	.35**	.48**	- .19*	.05	-.30**	-.28**	.49**	- .01	.25**	.50**	(.82)		
17. Support-Partner T_2	-.12	-.15*	.15*	.16*	.09	.09	.05	.46**	.06	.01	.14	-.03	.03	-.02	-.03	-.09	(.93)	
18. Support-Friends T_2	-.02	.03	-.04	.06	-.07	.01	-.05	.11	.50**	.06*	.04	.05	.06	-.03	-.11	.02	.14	(.78)

*Significant at $p \leq 0.05$. ** Significant at $p \leq 0.01$. Reliability of scales (Cronbach's α) shown in brackets.

T_1 and T_2 denote Time 1 and Time 2 assessments.

correlational pattern also provides some evidence for the validity of the measures in distinguishing between work and non-work types of social support.

The GHQ12 and social dysfunction measures were highly correlated, the *r* values were 0.72 for the Time 1 data, and 0.69 for the Time 2 data. Subsequent regression analysis was therefore concerned only with the GHQ12 since the validity of the significance tests would be considerably weakened if two very highly intercorrelated measures were used as indicators of health outcome.

(i) Cross-Sectional Prediction of Time 1 &Time 2 GHQ: Omnibus Regression Model and Regression Analyses including Only Single Components of Social Support

A strategy similar to the one used in the analysis of the entrepreneur data was used in examining the relationships among work, social support and outcome measures. First, a comprehensive, "omnibus" model in which all four types of support were included in the regression was tested. Individual regressions were then carried out for each of the four sources of social support. The order in which the independent variables were entered into the regression follows the approach outlined in Table 5.1 (Section 5.4). Time 2 variables were left out when the analysis concerned the prediction of Time 1 outcome. Similarly, Time 1 variables were omitted when Time 2 data were examined in cross-sectional analyses.

Cross-Sectional Prediction of Time 1GHQ: Full Regression Model

The results of the regression analysis of Time 1 GHQ are shown in Table 5.6.

Table 5.6 Cross-Sectional Analysis: Prediction of Time 1 GHQ - Omnibus Regression Model

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.096**	**.096**				**22.4**	
Gender			9.57	1,115	.01		- 2.372**
Age			< 1	1,115	*ns*		0.120
Marital Status			1.68	1,115	*ns*		6.910**
Education			< 1	1,115	*ns*		- 0.592
Period at Work			< 1	1,115	*ns*		- 0.225
2. Work, Social Support Measures	**.223**	**.127**				**29.6**	
Job Demand			< 1	1,109	*ns*		0.070
Job Discretion			2.56	1,109	.11		- 0.135
Support - Supervisor/Boss			9.18	1,109	.01		- 0.329**
Support - Coworker			< 1	1,109	*ns*		- 0.221
Support - Spouse/partner			< 1	1,109	*ns*		- 0.076
Support - Friends/Relatives			< 1	1,109	*ns*		- 0.281
3. 2-Way Interaction Terms	**.316**	**.093**				**21.7**	
Demand x Discretion			2.71	1,100	.10		- 0.005
Support Boss x Demand			< 1	1,100	*ns*		0.004
Support Boss x Discretion			< 1	1,100	*ns*		0.009
Support Coworker x Demand			1.53	1,100	.22		0.020
Support Coworker x Discretion			< 1	1,100	*ns*		0.033
Support Partner x Demand			< 1	1,100	*ns*		- 0.006
Support Partner x Discretion			< 1	1,100	*ns*		- 0.018
Support Friends x Demand			5.75	1,100	.01		0.047
Support Friends x Discretion			1.00	1,100	.32		- 0.002
4. 3-Way Interaction Terms	**.429**	**.113**				**26.3**	
Dem x Dis x Supervisor Support			< 1	1,96	*ns*		- 0.001
Dem x Dis x Coworker Support			2.46	1,96	.15		0.018
Dem x Dis x Partner Support			14.98	1,96	.01		- 0.017***
Dem x Dis x Friends Support			3.31	1,96	.07		0.015

$F(24,96)=3.01$, Sig. $F \leq 0.001$, constant=9.83

*$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms. For gender, females were coded 0 and males were coded 1.

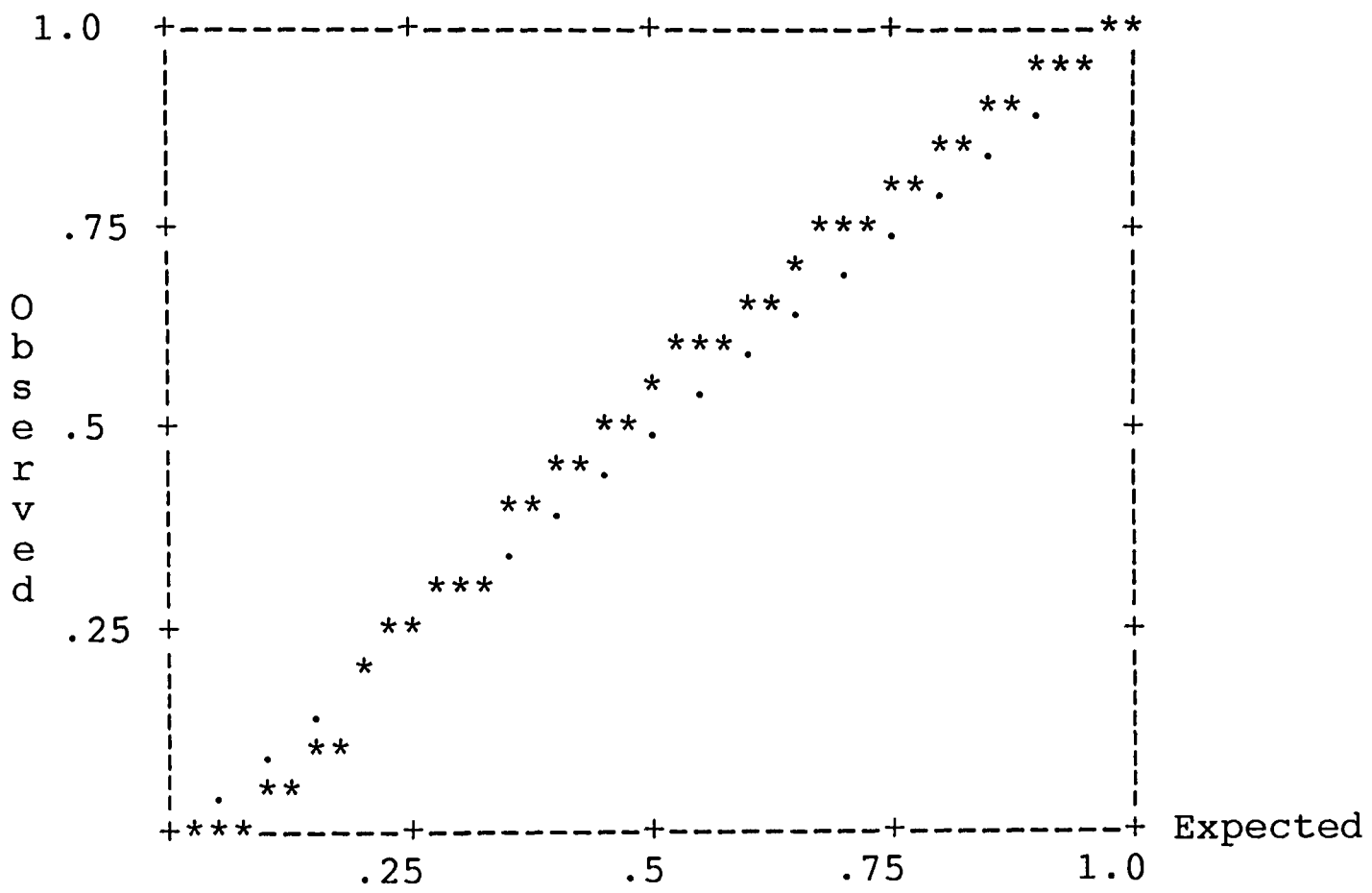
Gender and supervisor support, $p \leq .01$, was negatively correlated with GHQ. Of the nine cross-product terms entered in Step 3, job demand x support from friends, $p \leq .01$, significantly added to the R^2 value of the model. However, the F value of the single block of nine cross products was $F(9, 109)=1.23$, $p = .287$. The tests for three-way interactions showed that partner support x demand x discretion, $p \leq .01$, was highly significant in the prediction of GHQ. The F value for the three-way interaction terms entered in the final step was $F(4,96)=4.68$, $p = .002$.

A plot of the standardized residuals from the regression of Time 1 GHQ is shown in Figure 5.1. The pattern of results indicate that the residuals are approximately normally distributed.

Figure 5.2 and 5.3 shows the graphical presentation of the three-way interaction for partner support x demand x discretion. The regression equation was derived from the results in Table 5.6.

GHQ = 0.070 (Job Demand) + (-0.135)(Job Discretion) + (-0.076)(Partner Support) + (-0.018) (Job Discretion x Partner Support) + (-0.006)(Job Demand x Partner Support) + (-0.005)(Job Demand x Job Discretion) + (-0.017)(Job Demand x Job Discretion x Partner Support) + 9.83

Figure 5.1 Normal Probability Plot of Standardized Residuals From Cross-Sectional Analysis of Time 1 GHQ



Normal Probability Plot derived from Cross-Sectional Analysis of Time 1 GHQ - Table 5.6

Figure 5.2 Graph Showing Relationship Between Time 1 GHQ at High Job Discretion for High and Low Support

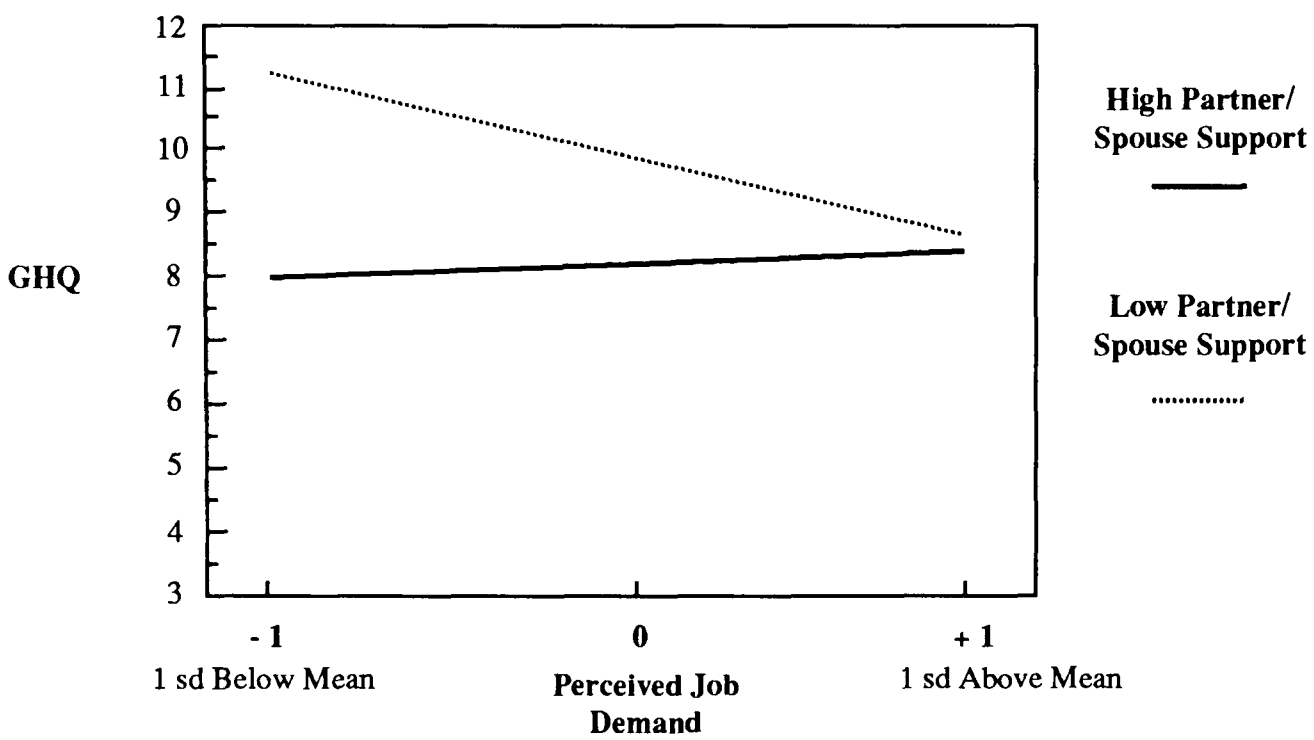
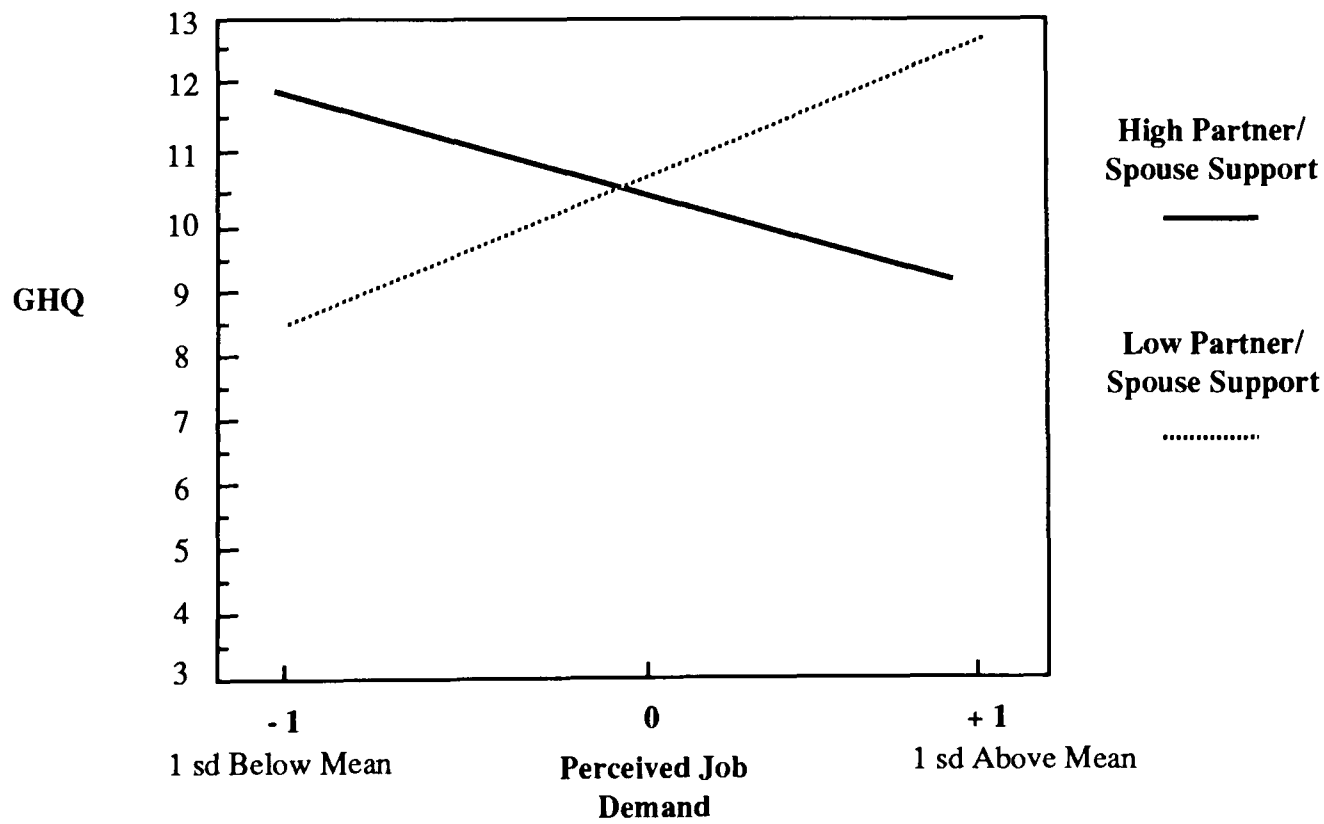


Figure 5.3 Graph Showing Relationship Between Time 1 GHQ at Low Job Discretion for High and Low Partner/Spouse Support



☛ **Figure 5.2 and 5.3 show 3-way interactions for partner support x demand x discretion and were derived from the results given in Table 5.6**

Figure 5.2 shows that at high discretion, perceived job demand is not related to GHQ for those with high partner/spouse support. On the other hand, job demand predicts GHQ for those with low partner/spouse support; low demand and low support is associated with generally higher GHQ. A cross-over interaction between partner/spouse support and job demand was found when the results from Table 5.6 were graphed holding job discretion at -1 standard deviation below the mean. Figure 5.3 shows that low, rather than high demand, is associated with higher GHQ for those with high partner/spouse support. The highest GHQ scores are found for those reporting low support and high demand. It should be noted that Figure 5.2 and Figure 5.3 represent three-way interaction effects for job demand x job discretion x partner/spouse support, holding job discretion at +1 sd (high discretion) and -1 sd (low discretion).

Cross-Sectional Prediction of Time 1 GHQ: Regression Analyses Including Only Single Components of Social Support

Time 1 Data

In order to ensure that true interaction effects did not remain undetected because of the relatively low power of the tests associated with the omnibus model, separate analyses which examined individual support measures as predictors of mental well-being and job satisfaction were carried out, that is, four separate analyses including supervisor, coworker, partner/spouse, and friends support respectively, were carried out. The results generally confirmed the findings of the more conservative approach. For instance, no two-way "support x stressor" interaction were evident in the regression of Time 1 GHQ except for friends support x demand, $F(1,108)=7.23$, $p \leq .01$. However, the individual analyses yielded significant three-way interactions for partner support x demand x discretion, $F(1,108)=13.62$, $p \leq .01$, and coworker support x demand x discretion, $F(1,108)=9.60$, $p \leq .01$. Job discretion was significant when entered as a main term in two of the four regressions.

Cross-Sectional Prediction of Time 2 GHQ: Full Regression Model

The results of the regression analysis of Time 2 GHQ are given in Table 5.7.

Table 5.7 Cross-Sectional Analysis: Prediction of Time 2 GHQ - Omnibus Regression Model

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.106**	**.106**				**26.2**	
Gender			5.49	1,115	.02		0.796
Age			1.57	1,115	.21		0.139
Marital Status			< 1	1,115	*ns*		- 4.137
Education			2.81	1,115	.10		- 0.969‡
Period at Work			3.86	1,115	.05		0.796
2. Work, Social Support Measures	**.280**	**.174**				**43.1**	
Job Demand			2.61	1,109	.10		0.120
Job Discretion			7.72	1,109	.01		- 0.169
Support - Supervisor/Boss			4.54	1,109	.03		- 0.210‡
Support - Coworker			1.14	1,109	.29		- 0.239
Support - Spouse/partner			< 1	1,109	*ns*		- 0.095
Support - Friends/Relatives			< 1	1,109	*ns*		- 0.019
3. 2-Way Interaction Terms	**.369**	**.089**				**22.1**	
Demand x Discretion			1.40	1,100	.24		0.010
Support Boss x Demand			2.08	1,100	.15		- 0.057*
Support Boss x Discretion			7.20	1,100	.01		0.050**
Support Coworker x Demand			< 1	1,100	*ns*		0.035
Support Coworker x Discretion			< 1	1,100	*ns*		0.005
Support Partner x Demand			< 1	1,100	*ns*		- 0.006
Support Partner x Discretion			< 1	1,100	*ns*		- 0.011
Support Friends x Demand			< 1	1,100	*ns*		- 0.019
Support Friends x Discretion			< 1	1,100	*ns*		0.010
4. 3-Way Interaction Terms	**.403**	**.035**				**8.6**	
Dem x Dis x Supervisor Support			3.74	1,96	.06		- 0.010‡
Dem x Dis x Coworker Support			< 1	1,96	*ns*		0.009
Dem x Dis x Partner Support			< 1	1,96	*ns*		0.002
Dem x Dis x Friends Support			< 1	1,96	*ns*		0.004

$F(24,96)=2.70$, Sig. $F \leq 0.003$, constant=10.82

‡$p \leq .06$. *$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms. For gender, females were coded 0 and males coded 1.

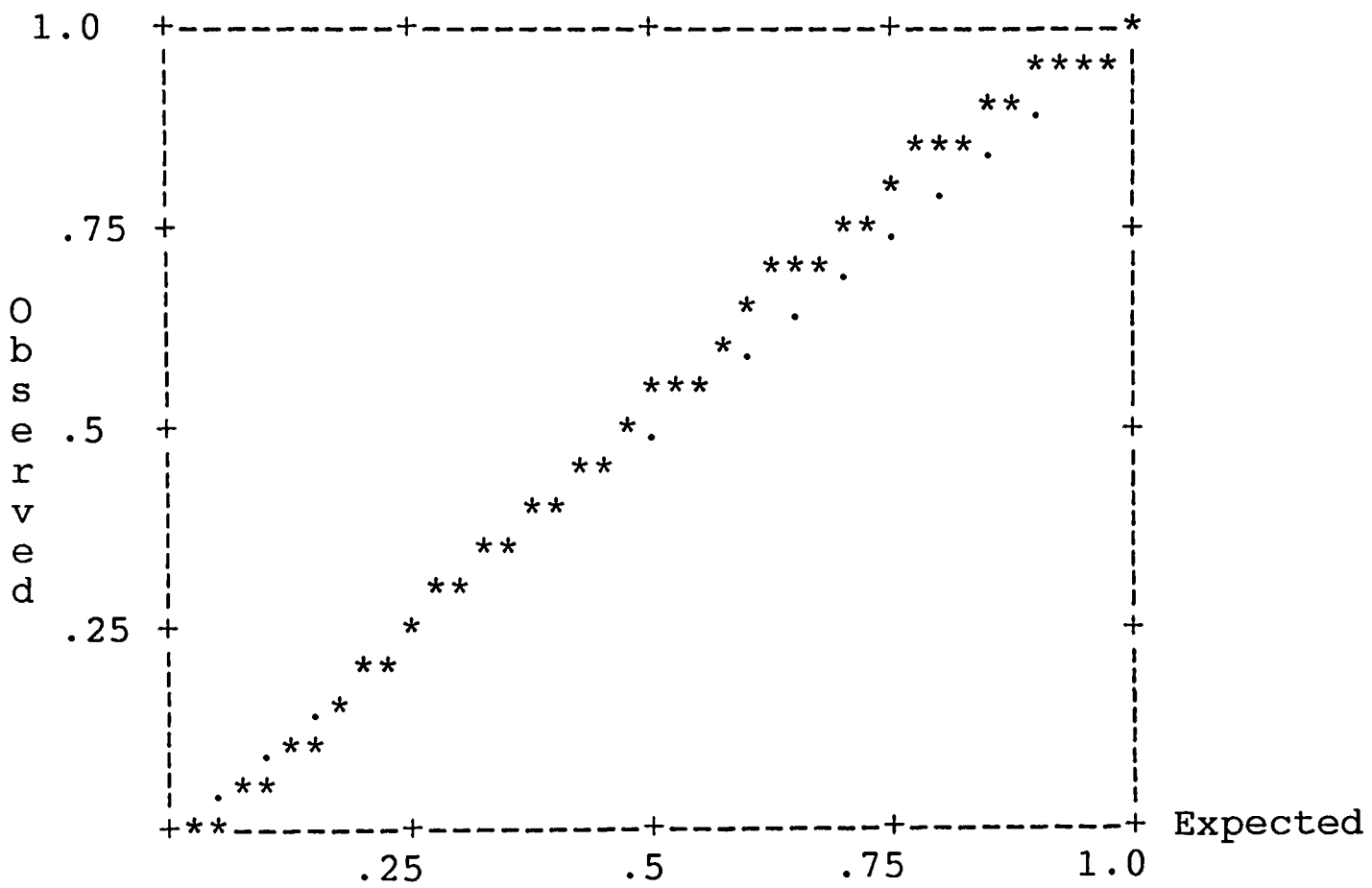
Gender, $p \leq .025$, and length of time since starting work at follow-up assessment (mean = 8.13 months, sd = .82), $p \leq .05$, were significant when entered in Step 1. Supervisor support, $p \leq .05$, and job discretion, $p \leq .01$, added to the incremental R^2 value when entered simultaneously with the other terms in Step 2 of the regression. Significant interaction effects were found for supervisor support x job demand, $p \leq .05$, and supervisor support x job discretion, $p \leq .01$. The overall R^2 increment for the nine cross-product terms was significant at $F(9,100)=2.26$, p =.04. When the three-way interaction terms were introduced in the analysis in the final step, supervisor support x demand x discretion showed a marginal interaction effect, $p \leq .06$. The overall F value for three-way interactions was $F(4,96)=1.39$, p = .244.

The normal probability plot in Figure 5.4 shows that the standardized residuals from the regression analysis (Table 5.7) of Time 2 GHQ are normally distributed.

The above results were used to derive a regression equation from which the two-way interaction for supervisor support x job discretion is presented in Figure 5.5.

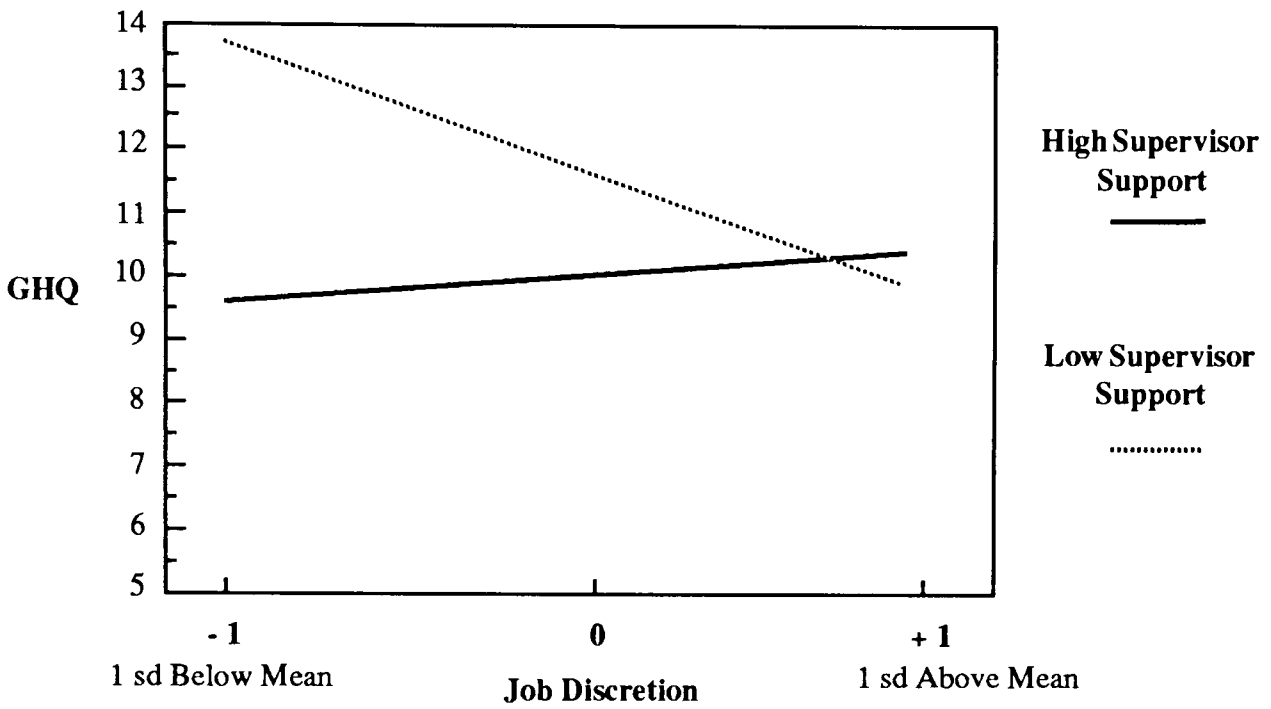
GHQ = - 0.169 (Job Discretion) + (- 0.210) (Supervisor Support) +
0.05 (Supervisor Support x Job Discretion) + 10.82

Figure 5.4 Normal Probability Plot of Standardized Residuals From Cross-Sectional Analysis of Time 2 GHQ



Normal Probability Plot derived from Cross-Sectional Analysis of Time 2 GHQ - Table 5.7

Figure 5.5 Graph Showing Relationship Between Time 2 GHQ and Job Discretion for High and Low Levels of Supervisor Support



(Figure 5.5 was derived from results given in Table 5.7)

Figure 5.5 shows the stress buffering effect of supervisor support on job discretion in relation to psychological health. Low job discretion was related to higher GHQ scores for those with low supervisor support, but not for those with high support. The highest GHQ scores were associated with the combination of low job discretion and low supportive relationships.

The three-way interaction effect for supervisor support x demand x discretion is presented in Figure 5.6 and Figure 5.7. The regression equation is given below.

GHQ = 0.120 (Job Demand) + (-0.169)(Job Discretion) + (-0.210)(Supervisor Support) + (0.050) (Job Discretion x Supervisor Support) + (-0.057)(Job Demand x Supervisor Support) + (0.010)(Job Demand x Job Discretion) + (-0.010)(Job Demand x Job Discretion x Supervisor Support) + 10.82

Figure 5.6 Graph Showing Relationship Between Time 2 GHQ at High Job Discretion for High and Low Supervisor Support

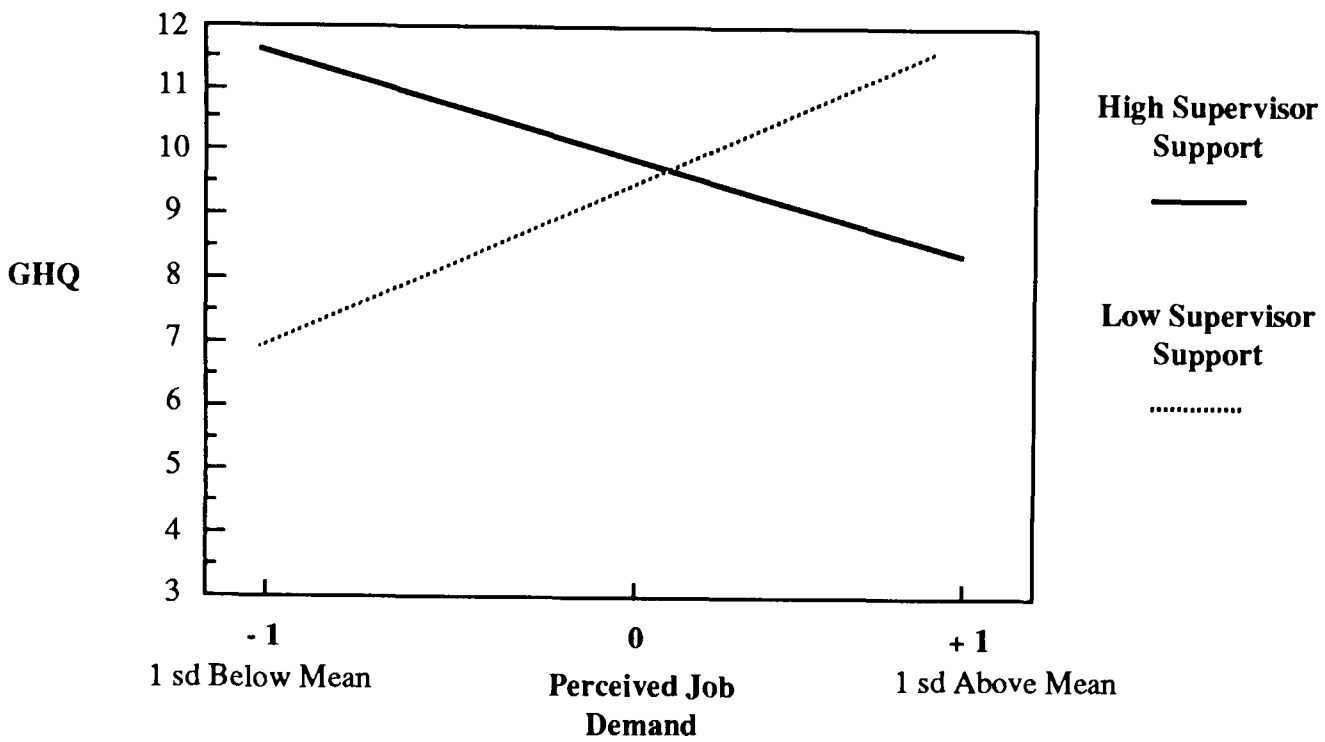
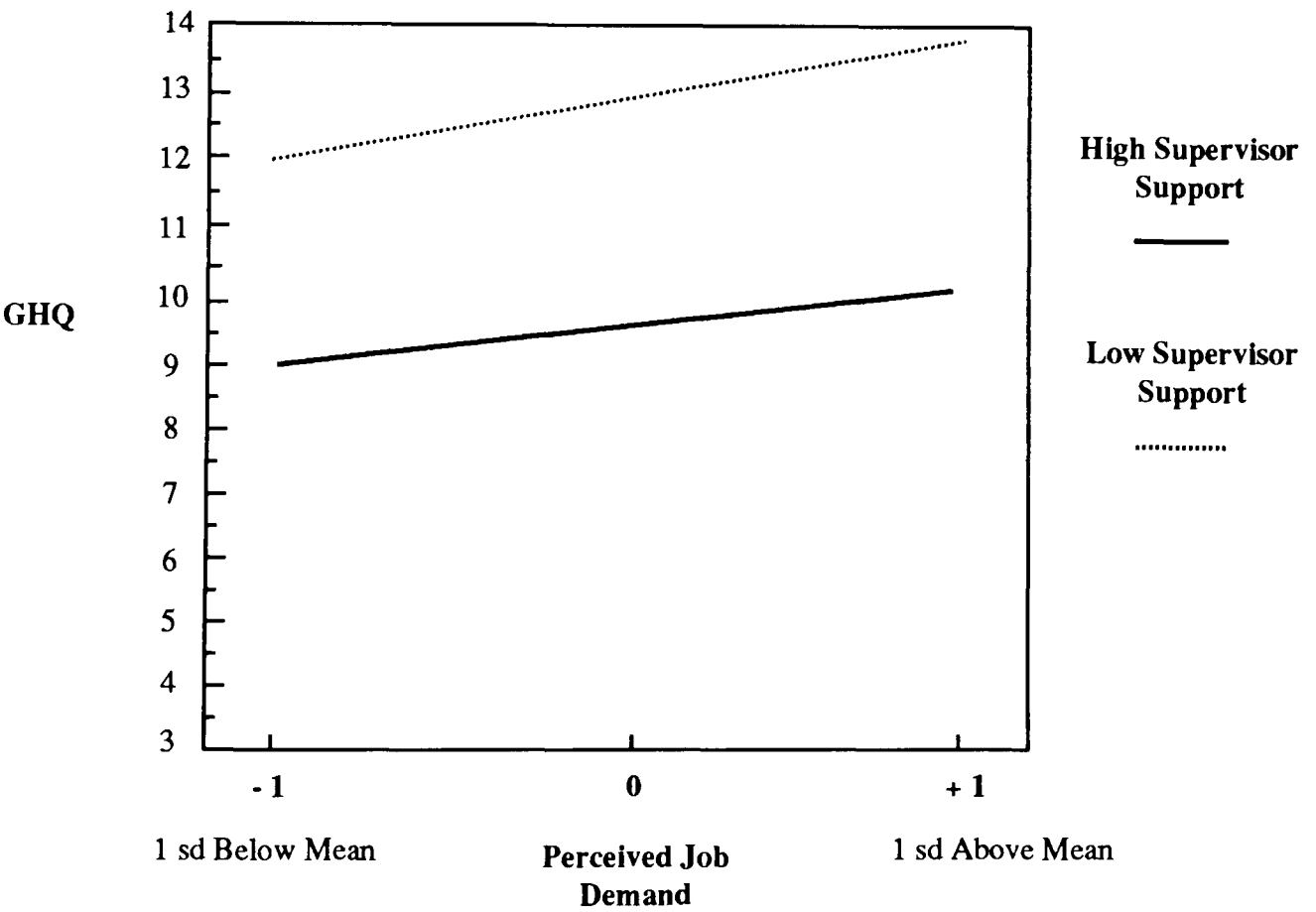


Figure 5.7 Graph Showing Relationship Between Time 2 GHQ at Low Job Discretion for High and Low Supervisor Support



☛ **Figure 5.6 and Figure 5.7 show 3-way interactions for supervisor support x demand x discretion and were derived from the results given in Table 5.7**

Figure 5.6 shows that at high job discretion, low GHQ is associated with the combination of high supervisor support and high demand, and, low supervisor support and low demand. High support/low demand, and low support/high demand is predictive of high GHQ. This cross-over interaction effect is similar to the one found in the Time 1 analysis for partner support x demand x discretion (Figure 5.3).

At low job discretion, (Figure 5.7) job demand is not predictive of GHQ for high and low supervisor support. High supervisor support, however, is associated with better psychological well-being compared to those with low supervisor support.

Cross-Sectional Prediction of Time 2 GHQ: Regression Analyses Including Only Single Components of Social Support

Job discretion significantly predicted GHQ in all four individual regressions, $F(1,112)$ 9.00, $p \leq .01$); supervisor support, $F(1,112)=8.70$, $p \leq .01$, and coworker support, $F(1,112)=4.48$, $p \leq .05$, were also significant. Significant interactions between supervisor support and job discretion, $F(1,100)=7.20$, $p \leq .01$, and supervisor support x demand x discretion, $F(1,96)=3.47$, $p \leq .065$, in the full model, were even stronger in the higher power, individual analysis, the F values being, $F(1,109)=11.07$, and $F(1,108)=4.52$, for the 2-way and 3-way interactions. Two 3-way interactions were found for partner support x demand x discretion, $F(1,108)=5.30$, $p \leq .025$, and friends support x demand x discretion, $F(1,108)=3.98$, $p \leq .05$.

Negative Affectivity

In order to evaluate the extent to which the significance of the relationships between work, social support and outcome variables might be confounded by negative affectivity, the initial additive stages of the regressions were repeated with the neuroticism measure entered into the regression after the demographic variables. Neuroticism was highly significant as a main term in all of the regressions of GHQ and generally reduced the variance accounted for by the work and social support variables. In the Time 1 analysis of GHQ scores in which all four support measures were included in the regression, the increment to the squared multiple correlation of the model contributed by the work and social support variables without controlling for neuroticism was .127, $F(6,109)=2.97$, $p \leq .01$, accounting for 40.2% of the overall variance, compared with the R^2 increment of .079, $F(6,108)=2.25$, $p \leq .05$, which accounted for 18.3% of the total variance when neuroticism was included in the model. For the Time 2 data, the additive work and social support variables, $F(6,108)=3.20$, explained 33.7% of the overall variance with trait neuroticism included in the analysis. The same predictor set of work and support variables,

$F(6,109)=4.39$, contributed 47.2% of the overall variance when neuroticism was dropped from the regression. The supervisor support x job discretion interaction, (Time 2 GHQ) however, remained significant in the presence of neuroticism.

On the whole, the presence of neuroticism in the model tended to increase the F values of the significant interaction terms for both GHQ and social dysfunction regressions. In the case of Time 2 social dysfunction, the product term demand x discretion, $F(1,100)=2.62$, $p = .11$, which was non significant in the analysis without controlling for neuroticism, became significant, $F(1,100)=5.09$, $p \leq .025$, when neuroticism was included.

(ii) Cross-Sectional Analysis of Time 1 and Time 2 Work Satisfaction

Cross-Sectional Prediction of Time 1 and Time 2 Work Satisfaction: Full Regression Model

None of the demographic variables predicted Time 1 or Time 2 job satisfaction. Supervisor support, $F(1,109)=4.47$, $p \leq .05$, and job discretion, $F(1,109)=51.44$, $p \leq .01$, were significant when entered as main terms in the Time 1 analysis, whereas supervisor support, $F(1,109)=6.09$, $p \leq .01$, coworker support, $F(1,109)=13.91$, $p \leq .01$, and job discretion, $F(1,109)=35.5$, $p \leq .01$, each added to the overall R^2 value of the model (Step 2) for the Time 2 analysis. None of the predicted two-way and three-way support x stressor interactions were significant in the Time 1 data but supervisor support buffered job discretion, $F(1,100)=4.15$, $p \leq .05$, in the Time 2 analysis.

As expected, work social support was highly significant in the prediction of job satisfaction, contributing a substantial amount of the overall variance. In contrast, there was no evidence of partner/spouse or friends/relatives support in mitigating work-related demands in relation to job satisfaction.

With the neuroticism component entered into the regression, the Time 2 data showed that the additive effects of work and social support variables, $F(6,109)=17.97$,

accounted for 76.0% of the overall variance of the model compared with 86.3% when neuroticism was dropped from the model, $F(6,108)=16.87$.

Cross-Sectional Prediction of Time 1 and Time 2 Work Satisfaction: Regression Analyses Including Only Single Components of Social Support

Time 1 Data

Job discretion was consistently significant ($p \leq .001$) when entered as a main term in all the four regressions on job satisfaction for each support variable. In addition, supervisor support, $F(1,112)=6.59$, $p \leq .025$. was the only main term which was significant. There was no evidence of two-way interactions, confirming the results of the comprehensive regression approach. Partner support x demand x discretion was significant at $F(1,108)=6.38$, $p \leq .01$.

Time 2 Data

Finally, the results from the separate regression models which examined each of the four social support resources on work stressors in relation to job satisfaction found no evidence of buffering effects. Job discretion showed highly robust main effects, $p \leq .001$, in all four analyses (similar to the results obtained at the Time 1 analyses) while supervisor support and coworker support predicted job satisfaction when entered as main terms.

To summarize, evidence for the buffering hypothesis of work social support was generally weaker in the Time 1 regression of GHQ than the interaction effects found in the Time 2 analyses. The Time 2 analyses revealed a moderating effect of supervisor support on job discretion in relation to GHQ, $F(1,109)=11.07$, $p \leq .01$. This interaction effect was already detected in the comprehensive regression model. Job discretion and supervisor support was negatively related to job satisfaction but no interactive effects of social support x work-related stressors were evident in both the Time 1 and Time 2 analyses.

5.5.3 Longitudinal Analysis - Time 1 and Time 2 Data

(i) Prediction of GHQ: Full Regression Model

The longitudinal analysis was based on the regression model shown in Table 5.2 (Section 5.4). The Time 2 multivariate hierarchical regression was duplicated by entering subject's scores on the Time 1 measures as a second step multivariate predictor. The data were examined using the comprehensive regression approach and individual analysis of the (four) social support measures. Table 5.8 gives a summary of the results of the analysis of work and social support variables in the prediction of GHQ.

Gender and period at work[8] showed significant R^2 increments when entered in the first step. Neuroticism was highly significant when entered in the second step. Only GHQ was significant when the Time 1 variables were entered next. In order to control for the Time 1 interaction effects between job demand, job discretion, and social support, nine cross-product terms (similar to the Time 2 multiplicative terms, Table 5.6) were entered into the regression after the main terms, in accordance with normal regression procedures. No statistically significant interaction effects were found. The R^2 increment was .024, contributing only 4.1% to the total amount of explained variance in the final model. Thus, although the Time 1 product terms provide a degree of control for possible contamination of interaction effects they also used up a large number of degrees of freedom and were dropped from the regression in subsequent analyses.

Of the six Time 2 variables simultaneously entered into the regression on Step 4, job discretion and supervisor support related negatively to GHQ whilst support from coworker made a marginal contribution. The F value for the block of six variables was $F(6,101)=3.84$, $p = .002$.

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8. Period at work refers to the length of time (in months) subjects had been working since leaving university at Time 2 assessment (mean = 8.13, sd =0.82).

Table 5.8 Longitudinal Analysis: Prediction of Time 2 GHQ Controlling for Neuroticism, Time 1 Work, Social Support, and GHQ Scores

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.106**	**.106**				**19.6**	
Gender			5.49	1,115	.02		-0.339
Age			1.57	1,115	.21		0.159
Marital Status			< 1	1,115	*ns*		-1.900
Education			2.81	1,115	.09		-0.565
Period at Work			3.86	1,115	.05		0.692
2. Neuroticism	.262	.156	24.01	1,114	.01	28.9	0.468***
3. Time 1 Variables	**.328**	**.066**				**12.3**	
GHQ			7.81	1,107	.01		0.239**
Job Demand			< 1	1,107	*ns*		-0.198
Job Discretion			< 1	1,107	*ns*		0.083
Support - Supervisor/Boss			< 1	1,107	*ns*		0.166
Support - Coworker			< 1	1,107	*ns*		-0.004
Support - Spouse/partner			1.11	1,107	.29		0.284**
Support - Friends/Relatives			< 1	1,107	*ns*		-0.164
4. Time 2 - Work/Support	**.452**	**.124**				**22.9**	
Job Demand			2.79	1,101	.10		0.232‡
Job Discretion			4.93	1,101	.03		-0.111
Support - Supervisor/Boss			4.44	1,101	.04		-0.231*
Support - Coworker			3.64	1,101	.06		-0.323
Support - Spouse/partner			< 1	1,101	*ns*		0.092
Support - Friends/Relatives			< 1	1,101	*ns*		0.096
5. Time 2 - Interaction Terms	**.540**	**.088**				**16.3**	
Demand x Discretion			7.43	1,92	.01		0.052***
Support Boss x Demand			4.80	1,92	.03		-0.053*
Support Boss x Discretion			4.10	1,92	.05		0.039*
Support Coworker x Demand			< 1	1,92	*ns*		0.006
Support Coworker x Discretion			< 1	1,92	*ns*		0.031
Support Partner x Demand			< 1	1,92	*ns*		0.009
Support Partner x Discretion			< 1	1,92	*ns*		-0.011
Support Friends x Demand			< 1	1,92	*ns*		-0.018
Support Friends x Discretion			1.32	1,92	.25		0.037

$F(28,92)=3.86$, Sig. $F \leq 0.0001$, constant=10.62

‡$p \leq .07$. *$p \leq .05$. **$p \leq .025$. ***$p \leq .01$.

[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms. All 3-way interactions (support x demand x discretion) were nonsignificant. For gender, females were coded 0 and males coded 1.

Three interaction effects were evident; demand x supervisor support, discretion x supervisor support and demand x discretion. The overall F value for the two-way interaction terms was $F(9,92)=1.95$, $p = .053$. None of the three-way interaction terms for support x demand x discretion were significant. Three two-way interaction terms from the results shown in Table 5.8 were evaluated according to the procedure described in Chapter 4 (Section 4.5.2).

(i) GHQ = 0.23(Job Demand) + (-0.23)(Supervisor Support)
+ (-0.05)(Job Demand x Supervisor Support) + 10.62

(ii) GHQ = -0.11(Job Discretion) + (-0.23)(Supervisor Support)
+ (0.04)(Job Discretion x Supervisor Support) + 10.62

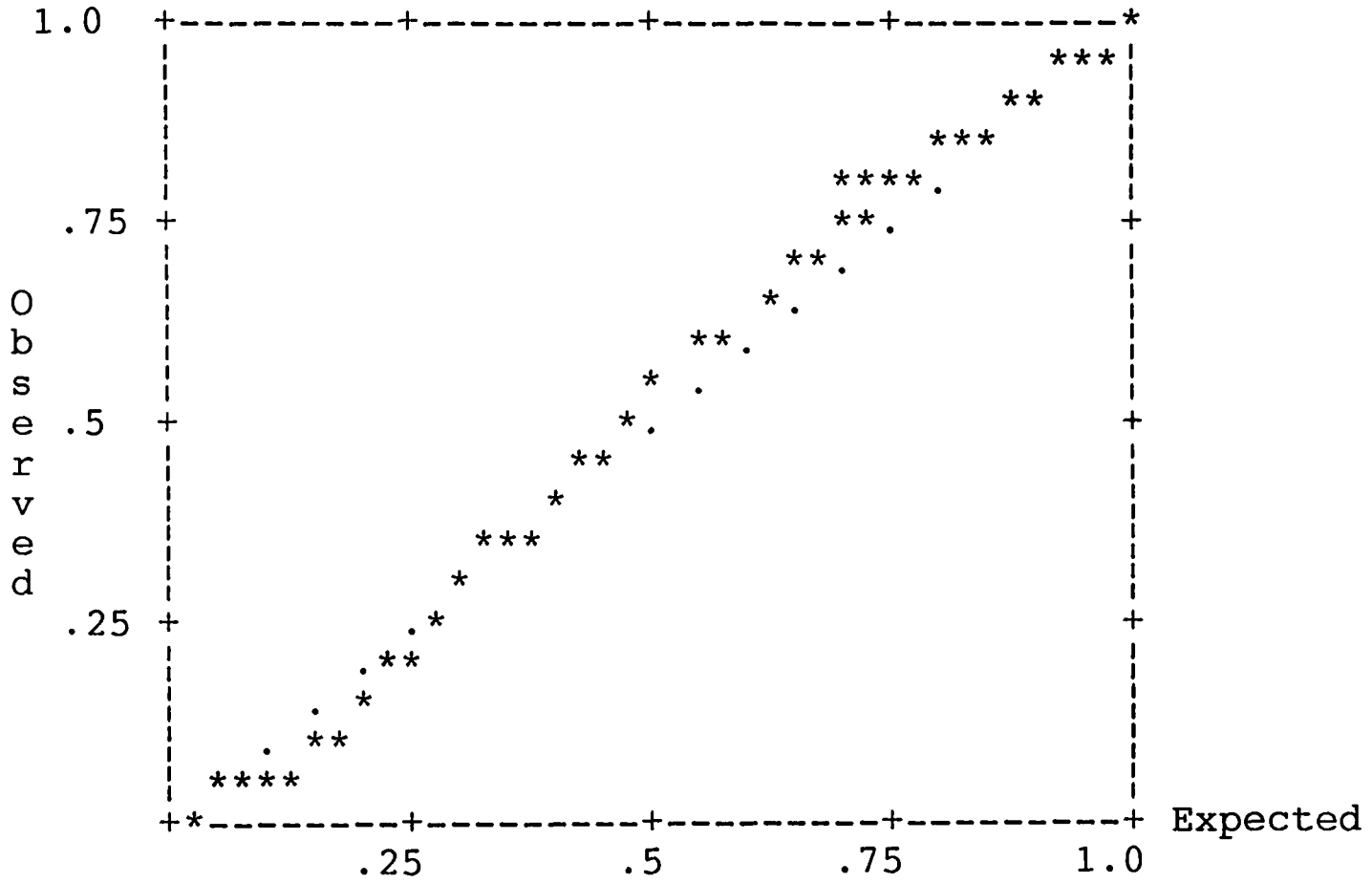
(iii) GHQ = 0.23(Job Demand) + (-0.11)(Job Discretion)
+ 0.05(Job Demand x Job Discretion) + 10.62

The normal probability plot for the standardized residuals of the longitudinal analysis is given in Figure 5.8. Examination of the observed and expected values indicate that the residuals are close to the normal distribution.

The two-way supervisor support x demand, and supervisor support x discretion interactions are shown in Figure 5.9 and Figure 5.10.

At high levels of supervisor support, changes in job demand (Figure 5.9) and job discretion (Figure 5.10) were not predictive of GHQ. For those with low supervisor support, GHQ was significantly related to job demand and job discretion.

Figure 5.8 Normal Probability Plot of Standardized Residuals From Longitudinal Analysis of Time 2 GHQ



Normal Probability Plot Derived From Longitudinal Analysis of Time 2 GHQ - Table 5.8

Figure 5.9 The Effects of Job Demand on Time 2 GHQ for High and Low Supervisor Social Support

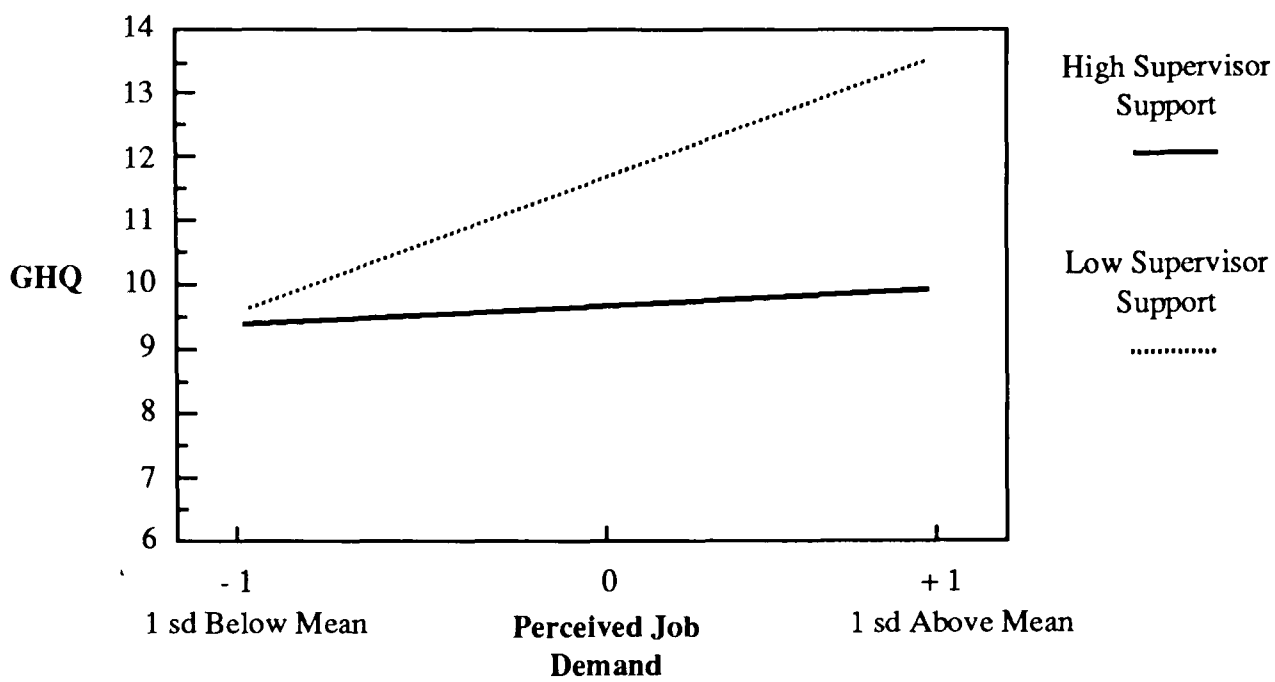
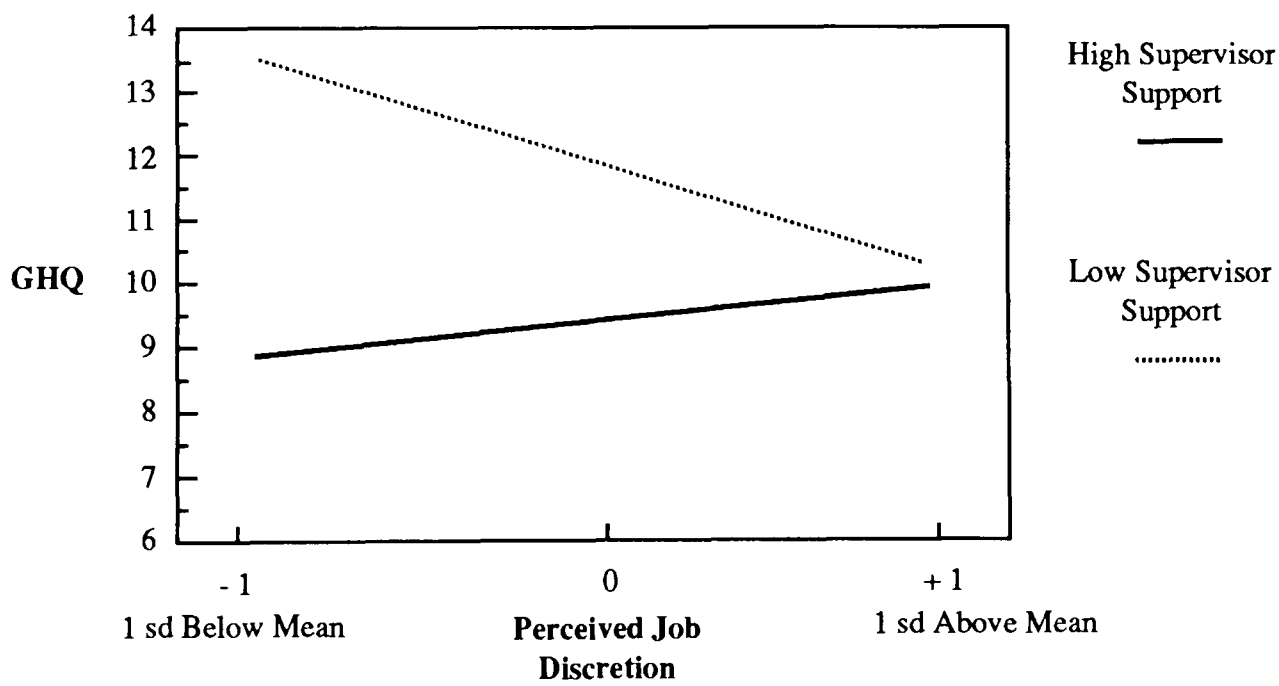


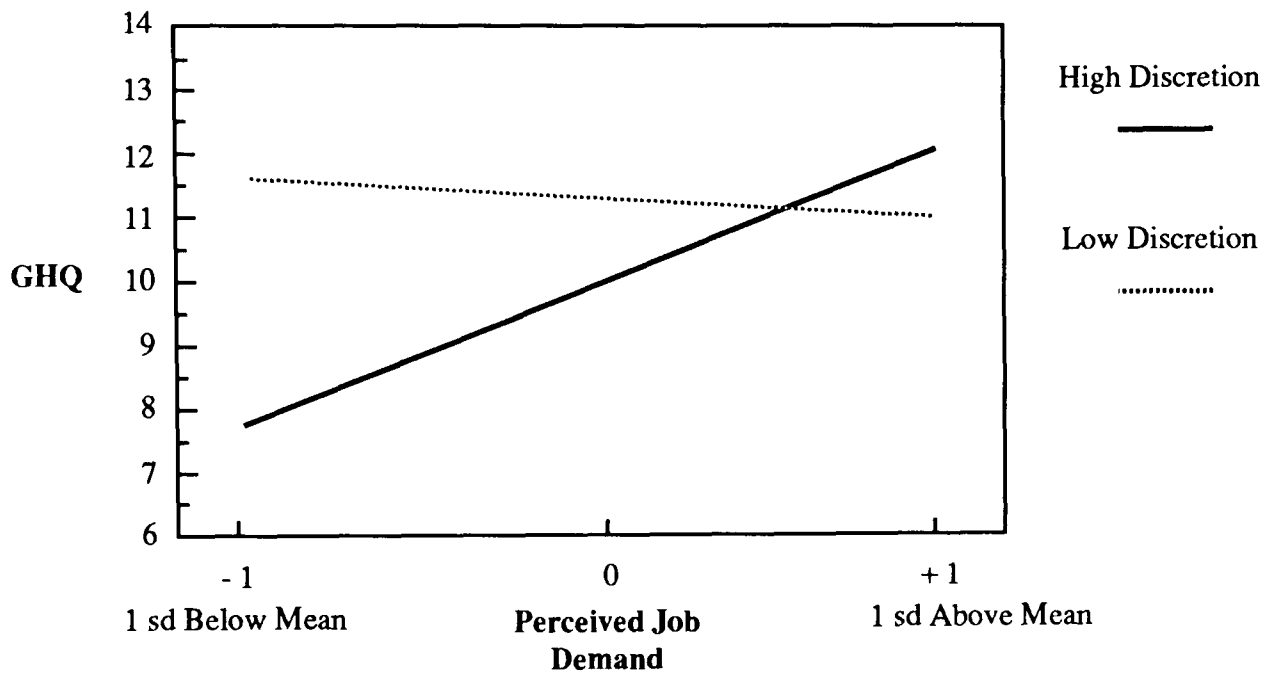
Figure 5.10 The Effects of Job Discretion on Time 2 GHQ for High and Low Supervisor Social Support



☛ **Figure 5.9 and Figure 5.10 show 2-way interactions and were derived from the results given in Table 5.8**

The demand x discretion interaction is shown in Figure 5.11.

Figure 5.11 The Effects of Job Demand on Time 2 GHQ for High and Low Job Discretion



☛ **Figure 5.11 was derived from the results given in Table 5.8**

Those reporting a low level of job discretion showed relatively consistent GHQ scores over high and low levels of job demand. In contrast, level of job demand (+1 or -1 sd) was significantly related to GHQ among high discretion workers. The group theoretically predicted to have lowest strain had the lowest GHQ levels, although the predicted adverse effects of high demand/low discretion were not found.

Prediction of GHQ: Regression Analyses Including Only Single Components of Social Support

The individual regression for supervisor support in relation to GHQ replicated the above results. Supervisor support, $F(1,110)=9.80$, $p \leq .01$, and job discretion, $F(1,110)=6.79$, $p \leq .01$, was positively related to GHQ and significant interactions for supervisor support x job demand, supervisor support x job discretion were also found. In addition, partner support x demand x discretion, $F(1,103)=4.00$, $p \leq .05$, and friends support x demand x discretion, $F(1,103)=4.62$, $p \leq .05$, also contributed to the overall squared multiple correlation of the model in the separate regressions. Coworker support did not moderate job discretion, $F(1,104)=2.81$, but when the analysis was duplicated without the neuroticism variable, a significant interaction was found, $F(1,105)=4.00$, $p \leq .05$.

(ii) Prediction of Work Satisfaction: Full Regression Model

None of the demographic variables predicted Time 2 job satisfaction. Consistent with the results from the GHQ measures, neuroticism, $F(1,114)=7.87$, $p \leq .01$, contributed a significant increment in the R^2 value, from .033 to .095, when entered in the second step but it was negatively related to job satisfaction. Of the six Time 1 variables entered as a single block in Step 3, only the criterion variable, job satisfaction, was significant, $F(1,114)=9.13$, $p \leq .01$. Time 2 job discretion, $F(1,101)=25.65$, $p \leq .01$, supervisor support, $F(1,101)=25.13$, $p \leq .025$, and coworker support, $F(1,101)=18.01$, $p \leq .01$, all contributed a substantial increase to the overall explained variance of the model. The product terms for support, demand and discretion did not reach statistical significance when entered in the final step of the analysis. The overall squared multiple correlation of the model was .774.

Results from analyses in which only single components of social support were used confirmed the findings of the omnibus regression approach. There was no evidence of main or interactive effects for the non-work (partner/spouse, friends/relatives) support measures in relation to job satisfaction.

5.5.4 Personality Variables as Stress Moderators

One of the aims of the present study was to examine the stress-buffering role of personal resources in the response to work-related stressors. Further exploratory analyses were carried out to test whether personal efficacy locus of control, interpersonal locus of control, and neuroticism moderated psychological job demand and job discretion in relation to GHQ and job satisfaction. Demographic variables were entered first, followed by the personality trait measures, work stressors (job demand and job discretion) and the appropriate cross-product terms.

The means, standard deviations and intercorrelations for the personality and outcome measures are given in Table 5.9. Table 5.10 shows the results from the analysis of the stress moderating role of personality factors in the prediction of Time 1 GHQ. The interaction between personal efficacy LOC and job discretion is graphed in Figure 5.12.

A highly significant interaction, $p \leq .01$, was found for personal efficacy LOC x work discretion in the prediction of Time 1 GHQ. The incremental R^2 value for the interaction terms entered in Step 4 of the analysis was $F(6,104)=1.58, p = .15$. None of the six cross-product terms between personality factors and work-related demands (see Step 4, Table 5.10) were significant in the prediction of Time 2 GHQ. However, neuroticism moderated job discretion in relation to Time 1, $F(1,104)=8.42, p \leq .01$, and Time 2, $F(1,104)=10.01, p \leq .01$, job satisfaction.

Table 5.9 Means, SDs, & Pearson Intercorrelations of Personality Factors and Time 1 and Time 2 Outcome Measures, Oxford Graduates Data

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	0.63	0.49	(. -)												
2. Neuroticism	4.33	0.63	-.26**	(.77)											
3. Extraversion	7.67	3.12	-.12	-.22*	(.82)										
4. Interpersonal LOC	48.55	8.30	-.05	-.26**	.59**	(.74)									
5. Personal Efficacy LOC	51.07	6.38	.03	-.14	.07	.17	(.71)								
6. Health T_1	2.98	0.81	.09	-.45**	.14	.09	.03	(. -)							
7. GHQ T_1	9.92	5.10	-.28**	.49**	-.18*	-.17‡	-.06	-.27**	(.83)						
8. GHQ S.Dysfunction T_1	6.10	2.86	-.18*	.41**	-.16	-.19*	-.01	-.24**	.72**	(.68)					
9. Job Satisfaction T_1	11.74	2.70	.08	-.31**	.24**	.16	.19*	.20*	-.46**	-.47**	(.89)				
10. Health T_2	2.78	0.99	.16	-.41**	.07	.11	.06	.46**	-.28**	-.14	.29**	(. -)			
11. GHQ T_2	11.20	5.30	-.21*	.46**	-.12	-.05	-.07	-.19	.43**	.28**	-.22**	-.43**	(.83)		
12. GHQ S.Dysfunction T_2	6.71	2.87	-.22**	.33**	-.10	-.02	-.09	-.06	.37**	.24**	-.16	-.33**	.69**	(.74)	
13. Job Satisfaction T_2	10.32	3.42	.11	-.29**	.19*	.11	.09	.21*	-.32**	-.29**	.45**	.36**	-.52**	-.48**	(.89)

*Significant at $p \leq 0.05$. ** Significant at $p \leq 0.01$. Reliability of scales (Cronbach's alpha) shown in brackets.

Gender was coded 0 for females and 1 for males. T_1 and T_2 denote $Time_1$ and $Time_2$ assessments.

Table 5.10 Regression Analysis of Personality Factors in Moderating Work-Related Stressors in Relation to Time 1 GHQ

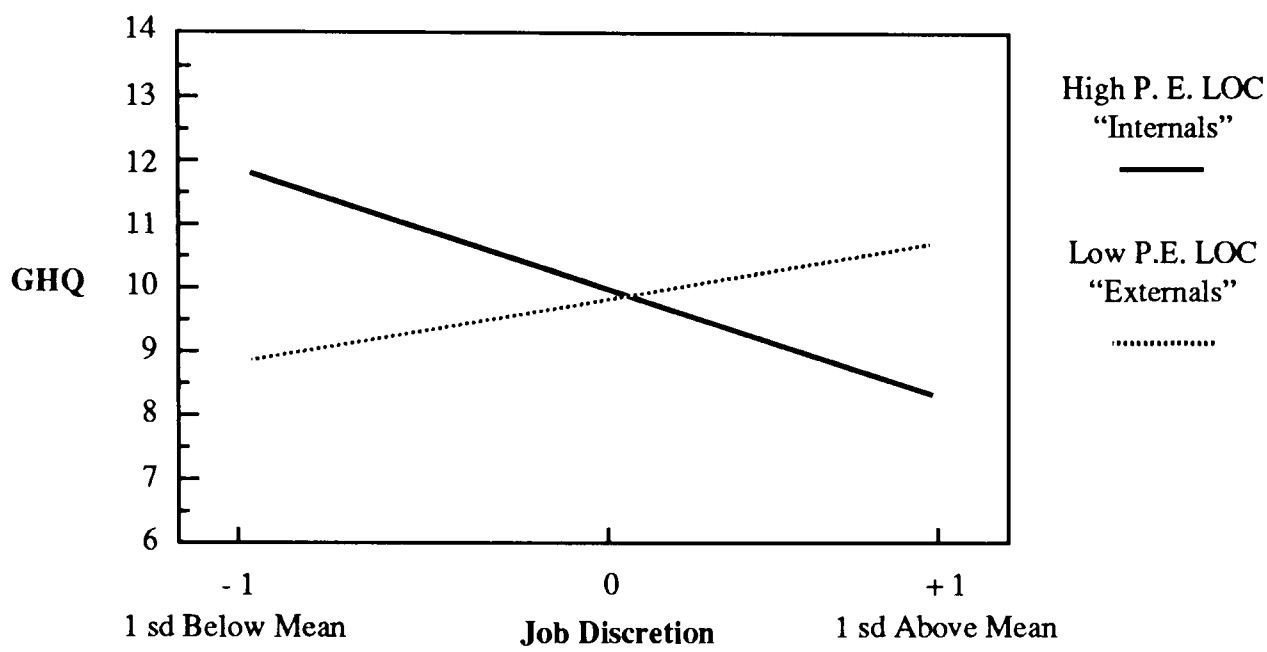
Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.096**	**.096**				**26.6**	
Gender			9.57	1,115	.01		- 1.498
Age			< 1	1,115	*ns*		- 0.134
Marital Status			< 1	1,115	*ns*		5.300*
Education			1.60	1,115	*ns*		- 0.130
Period at Work			< 1	1,115	*ns*		- 0.596
2. Personality Measures	**.292**	**.194**				**53.8**	
Trait Neuroticism			25.00	1,112	.01		0.710***
Interpersonal LOC			< 1	1,112	*ns*		- 0.022
Personal Efficacy LOC			< 1	1,112	*ns*		0.028
3. Work Measures	**.304**	**.012**				**3.5**	
Job Demand			< 1	1,110	*ns*		- 0.006
Job Discretion			1.41	1,110	.03		- 0.092
4. Interaction Terms	**.362**	**.058**				**16.1**	
Interpersonal LOC x Discretion			< 1	1,104	*ns*		- 0.001
Interpersonal LOC x Demand			< 1	1,104	*ns*		0.004
Personal Efficacy x Discretion			6.92	1,104	.01		- 0.037***
Personal Efficacy x Demand			< 1	1,104	*ns*		- 0.001
Neuroticism x Discretion			2.88	1,104	.09		- 0.049
Neuroticism x Demand			< 1	1,104	*ns*		0.024

$F(16,104)=3.69$, Sig. $F \leq 0.0001$, constant=9.92

$^{\ddagger}p \leq .07$. $^{*}p \leq .05$. $^{**}p \leq .025$. $^{***}p \leq .01$.

[a]The B values are the unstandardised coefficients from the final regression equation, each term being corrected for all other terms.

Figure 5.12 Graph of Time 1 GHQ against Job Discretion for High and Low Personal Efficacy Locus of Control



☛ **Figure 5.12 was derived from the results given in Table 5.10**

The regression coefficients for Figure 5.12 were obtained from the β values in the final column of Table 5.10 and the regression equation is given below.

$$GHQ = 0.028(LOC) + (-0.092)(\text{Job Discretion}) + (-0.037)(LOC) \times (\text{Job Discretion}) + 9.92$$

For internal LOC subjects, job discretion was inversely related to GHQ, high GHQ being associated with low job discretion. For external LOC individuals, GHQ was positively related to job discretion. The combination of high LOC and high job discretion indicates a congruence effect in that they report better psychological health compared to the internals and low discretion group. Another form of the congruency effect can also be seen in externals and low discretion subjects as this combination is also associated with lower GHQ.

Individual Preferences in Work Characteristics

The question of whether reactivity to work stressors is influenced by individual differences in the preference for particular types of work characteristics was examined in the present study using the Work Preferences Questionnaire (WPQ).

A description of the WPQ and its psychometric properties was given in Section 5.2 and also in Chapter 3 (Section 3.1.2). Two factors were derived from analysis of the dimensional structure of the questionnaire (Chapter 3). The first factor (Factor 1) was labelled ""esteem/social" and describes the intrinsic characteristics of work that include opportunities for challenge, achievement, socially useful work and social interaction. The second factor (Factor 2) was labelled "work routine" and refers to the extrinsic characteristics of work such as regular work hours, familiar, undemanding routines, and the physical work environment.

In order to reduce concurrent bias in assessing the "preferred" component of the WPQ, this part of the questionnaire was administered at Time 1 of the study, when subjects had just started work. The "actual" job part of the questionnaire was given at the follow-up assessment, about six months later.

French, Rodgers and Cobb (1974) outlined a method for quantifying the relationship between adjustment and coping as the goodness-of-fit between the characteristics of the person and the properties of the environment. Their procedure was used in the present study to create an index reflecting the discrepancy between what people preferred and what they actually experienced in their daily work; factor scores of the "actual" job were subtracted from the "preferred" scores. Negative (difference) scores generally indicate that "actual" scores are greater than "preferred" scores while positive scores indicate the reverse. For example, a difference score of -4 on an item *"A familiar, undemanding routine"* in Factor 1 ("esteem/social") means that the subject rated this job characteristic as "not at all important" (score of 1 on "preferred" form of the questionnaire)

but reported that the "actual" job contained a very high component of this attribute (score of 5 on "actual" form of questionnaire). Conversely, a score of, say, +4 on an item *"Challenging work"* shows that the respondent would have preferred this feature of work a great deal (score of 5 - "preferred" scale) but only found a minimum of that attribute (score of 1 on "actual" scale) in his or her current work. A zero difference score represents a perfect match between preferred and actual job characteristics.

"Esteem/Social" (Factor 1) and "Work Routine" (Factor 2) Factors in the Prediction of Psychological Health and Job Satisfaction.

Multiple regression was used to examine if the match between preferred and actual job attributes contributed to feelings of work satisfaction and mental well-being. The analysis was performed only on the Time 2 data since the "actual job description" part of the questionnaire was not included in the first assessment. In order to reduce the number of interaction terms that would be needed to test the moderating effects of the extrinsic and intrinsic job factors on the social support variables, the four support measures were combined into two measures. The rationale for this classification was based on the two categories of work and non-work social support that were assessed from the four support sources. A work support index was derived by summing the scores from supervisor and coworker support. A non-work support score was obtained by combining scores from spouse/partner and friends/relatives. The results of the regression analysis are shown in Table 5.11.

Table 5.11 Analysis of Relationships Between Individual Preferences in Work Characteristics (Factor 1, Factor 2), Work-Related Stressors, and Time 2 GHQ

Source	Cumulative R^2	R^2 Increment	F	df	p	% of Explained Variance	B[a]
1. Demographic Variables	**.106**	**.106**				**28.9**	
Sex			5.49	1,115	.021		- 1.82‡
Age			1.57	1,115	.213		0.176
Marital Status			< 1	1,115	.635		- 0.149
Degree Class			2.81	1,115	.096		- 1.026*
Period at Work			3.86	1,115	.052		0.331
2. Difference Factor Scores	**.149**	**.043**				**11.8**	
Factor 1 - "Esteem/Social"			5.52	1,113	.018		0.032
Factor 2 - "Work Routine"			< 1	1,113	.618		0.080
3. Time 2 - Work/Support	**.279**	**.130**				**35.5**	
Job Demand			2.39	1,109	.124		0.266**
Job Discretion			5.97	1,109	.016		- 0.216*
Work Support			8.33	1,109	.005		- 0.234***
Non-Work Support			< 1	1,109	.993		0.016
4. Time 2 - Interaction Terms	**.366**	**.087**				**23.8**	
Factor 1 x Demand			5.42	1,101	.022		- 0.033**
Factor 1 x Discretion			< 1	1,101	.385		0.013
Factor 2 x Demand			1.57	1,101	.214		- 0.028
Factor 2 x Discretion			< 1	1,101	.689		0.007
Factor 1 x Work Support			2.76	1,101	.099		- 0.018
Factor 1 x Non-Work Support			< 1	1,101	.685		0.005
Factor 2 x Work Support			4.36	1,101	.039		0.034*
Factor 2 x Non-Work Support			2.94	1,101	.089		0.035

$F(19,101)=3.07$, Sig. $F=0.0001$, constant=11.21

‡ $p \leq .07$. * $p \leq .05$. ** $p \leq .025$. *** $p \leq .01$.

[a]The B values are the unstandardized coefficients from the final regression equation, each term being corrected for all other terms. All 3-way interactions (support x demand x discretion) n.s.

Work support: Supervisor + coworker support; Non-work support: Spouse/partner + friends/relatives support.

Factor 1 - "Esteem/Social " describes work that is challenging, interesting, absorbing, allows opportunities for achievement, social interaction.d

Factor 2 - "Work Routine" describes characteristics of job relating to predictable work, regular hours, clean, pleasant work environment, work that is finished at the end of the day etc.

After controlling for demographic variables, Factor 1 ("esteem-social") was positively[9] related to Time 2 GHQ and contributed a significant increment to the R^2 value of the model when entered in Step 2 of the analysis. Job discretion and non-work support were significant in predicting GHQ when entered in Step 3. Finally, the eight cross-product terms were entered into the regression, $F(8,101)=1.74$, $p \leq .09$. The interaction terms Factor 1 ("esteem/social") x job demand and Factor 2 ("work routine") x work support significantly added to the overall variance above and beyond that accounted for by other variables already in the model. The R^2 increment for the eight interaction terms was $F(8,101)=1.93$, $p = .07$ (Step 4).

Two regression equations were derived from the results in Table 5.10 and used to graph the interactions for Factor 2 x work-related support, shown in Figure 5.13, and Factor 1 x job demand, shown in Figure 5.14.

(i) GHQ = 0.08(Factor 2) + (-0.234(Work-Related Support) +
0.034 (Factor 2 x Work-Related Support) + 11.21

(ii) GHQ = 0.032(Factor 1) + 0.266(Job Demand) +
(-0.033) (Factor 1 x Job Demand) + 11.21

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9. The positive correlation of Factor 1 with GHQ indicates that discrepancies between "preferred" and "actual" job" concerning intrinsic work attributes are related to psychological health. In contrast, "mismatch" for the "work routine" factor (Factor 2) was not significant as a main term predictor of GHQ.

Figure 5.13 Graph of Time 2 GHQ against Work-Related Support for High and Low Factor 2 ("Work Routine") Scores

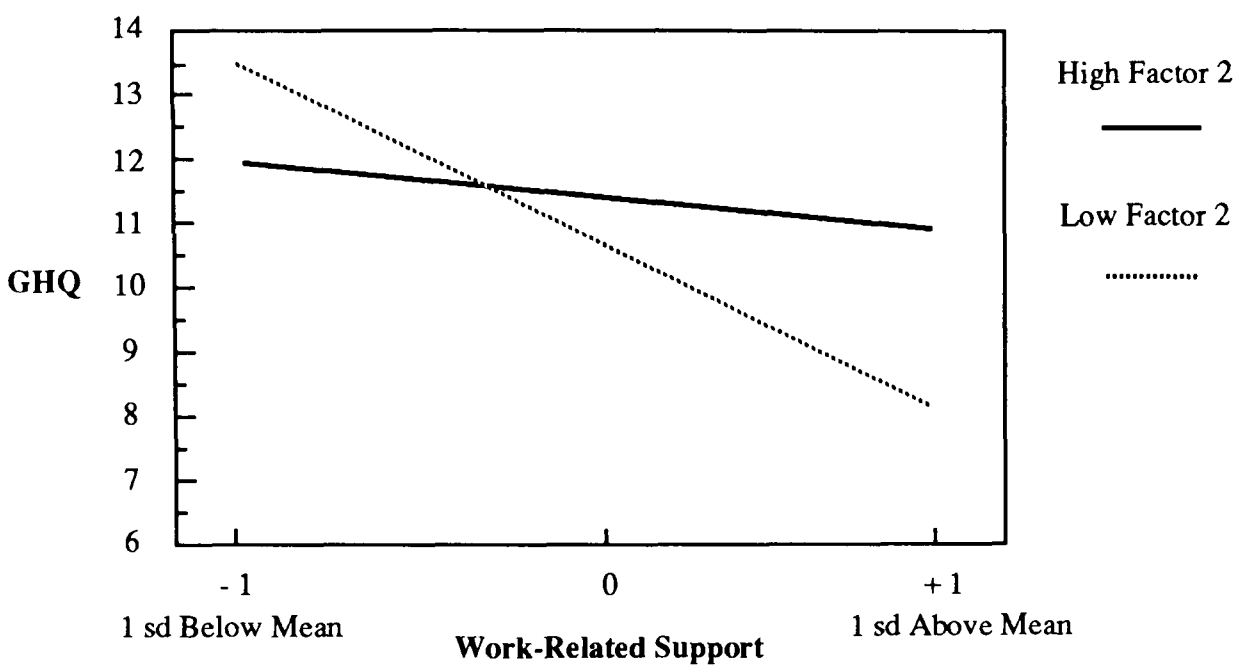
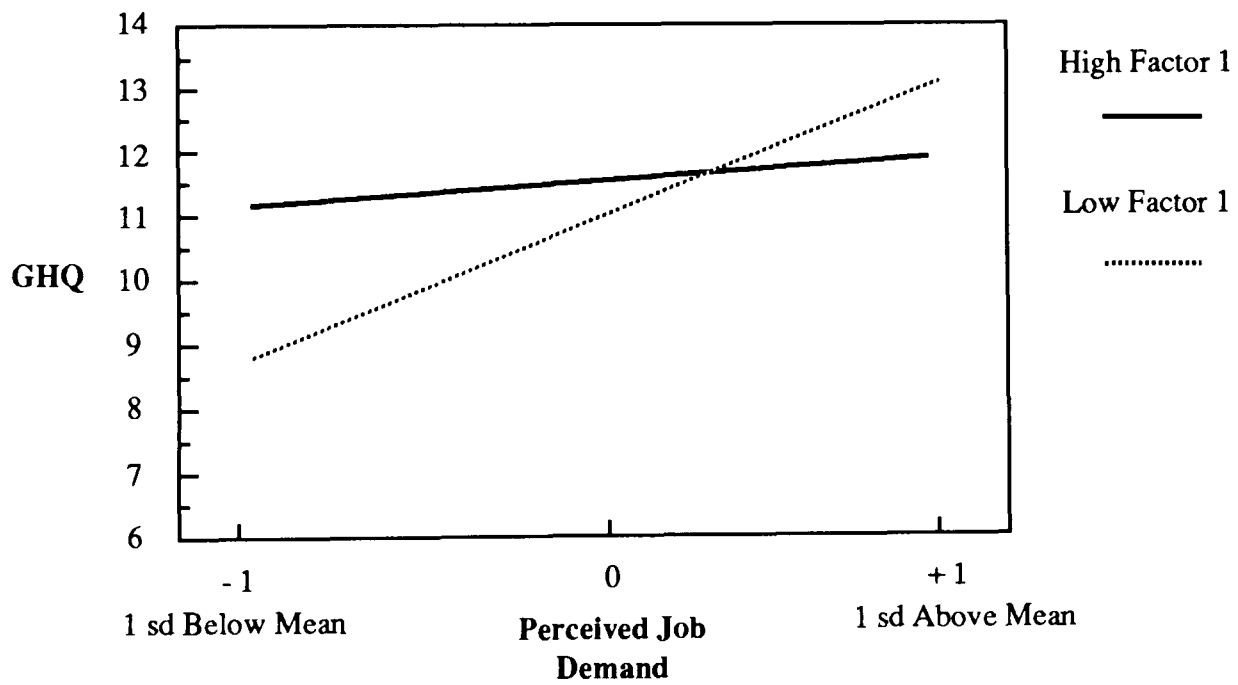


Figure 5.14 Graph of Time 2 GHQ against Job Demand for High and Low Factor 1 ("Esteem/Social") Scores



☛ Figure 5.13 & Figure 5.14 were derived from results given in Table 5.11. Work-related support = Supervisor support + coworker support).

It is important to clarify the meaning of the factor scores.[10] If the difference factor score (i.e. "preferred" minus "actual") is small, than the work situation is better. A high factor score indicates that there is quantitatively "less" of the preferred attribute. Conversely, a low factor score shows that the job provides more than the preferred work or task characteristic. The "esteem-social" factor (Factor 1) was positively correlated with Time 2 GHQ, $r = 0.25, p \leq .01$, indicating that poor "fit" between preferred and actual job is associated with higher levels of GHQ. "Work routine" (Factor 2) was not related to psychological health.

The results from the regression of Time 2 job satisfaction revealed only main effects for esteem-social motivator factors, $F(1,113)=45.91$, job discretion, $F(1,109)=17.10$, and work support, $F(1,109)=22.02$. None of the eight product terms between job demand, job discretion, social support, esteem-social motivator and hygiene factor were significant when entered as a single block in the final step. The overall multiple correlation was .783.

Figure 5.13 shows that high Factor 2 ("work routine") does not predict GHQ for high or low work-related social support individuals. For those low on Factor 2, work-related support is negatively associated with GHQ, the combination of low support and low Factor 2 predicting highest GHQ.

The interaction between Factor 1 ("esteem-social") and job demand (Figure 5.14) demonstrates that the combination of low "esteem-social" factor (i.e. subjects are getting greater amounts of opportunities for challenge, achievement, social interaction etc. than preferred) and high job demand is predictive of the highest GHQ. Low demand and low "esteem-social" scores are associated with the lowest GHQ. High Factor 1 scores are not significantly associated with psychological well-being.

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10. Factor Score = ("Preferred - Actual"). High Factor Score indicates quantitatively less of the preferred work characteristic (Preferred - Actual = positive value, represented as a high score). Low Factor Score indicates quantitatively ***more*** of the preferred work characteristic (preferred - actual = negative value, coded as low factor score)

5.6 Discussion

Introduction

The transition from education to work marks the beginnings of a new process of socialization and development for most young workers. Some of the difficulties and potential sources of stress which are likely to be experienced by new job entrants in the early months of employment were described in the introduction to this chapter. There is evidence that the effectiveness with which the problems of starting work is resolved are strongly influenced by organizational socialization techniques (Nicholson, 1984). Good, supportive relationships may further facilitate the transition process. The transactional approach to stress discussed in Chapter 1 emphasized the importance of considering the combination of psychosocial and work environmental factors in the stress process. In studying how young graduates adjust and cope with their new work roles, the present investigation focused on the relations between job characteristics, individual differences and social support in the prediction of psychological health.

The present study examined the relations between work demands, social support and psychological health among a group of recent graduates starting work. The general picture that emerged is that the psychological health of subjects deteriorated between the initial and follow-up assessment, about six months after the start of the study. Two factors, however, mitigated the negative effects of work-related stressors on job satisfaction and GHQ. The results provided evidence that social support moderated the relationships between work demands and health-related outcomes. Individual differences in personality also ameliorate the negative effects of work stress.

These findings are discussed in the following sequence: (i) changes in work, social support and health-related outcomes between Time 1 and Time 2; (ii) the role of social support as a moderator variable in the relationship between stress and illness; (iii) work discretion and job demand in relation to psychological health; (iv) the relationship between

work discretion, job demand and social support in the prediction of psychological well-being; (v) some implications of (iv) for job redesign; (vi) individual differences in personality and its role in the stress-health relationship.

5.6.1 Changing Levels of Work Demands and Psychological Health Between Time 1 and Time 2

The findings show a decline in levels of work discretion and job satisfaction between initial assessment and follow-up at about six months later; these changes were reflected in lowered psychological well-being. The GHQ and social dysfunction scores, in particular, were significantly higher at the Time 2 assessment. Mean GHQ scores at Time 1, are however, comparable to data for other occupational groups reported in the recent work stress literature (see Chapter 3, results section). Longitudinal data (n=45) from a sample of white collar workers in the publishing industry showed less marked differences on similar work and health outcome measures (for males and females) assessed about eight months apart (see Chapter 3 for summary statistics); no significant (gender) differences in work demands, job discretion, job satisfaction, GHQ and social dysfunction were found between Time 1 and Time 2. The publishing company sample, however, comprised subjects who had been working for the company, on average, about four years with a mean age of 39.5 years (sd=8.92).

The GHQ scores in the present study are also higher than those reported by the entrepreneur and employee sample (see Table 3.4, Chapter 3). It is evident that the present group of job entrants reported significantly higher levels of distress than say, workers in the publishing company. The data from the publishing company study showed relatively unchanging levels of perceived work demands and health-related outcome between assessments in comparison with the graduate sample and this might suggest that the transitional period from education to working life may indeed be associated with higher risks of impaired well-being.

Results from the *t*-test of Time 1 and Time 2 work measures revealed significant differences in work discretion for females but not for males (Table 5.3). Furthermore, males reported higher job discretion than females at both assessments. Subsequent regression analyses showed that job discretion rather than job demand was a highly significant predictor of health outcome in the present study. Gender differences in perceived job demand and job discretion were also found in the publishing company data (see Table 3.5, Chapter 3) which showed similar results at both Time 1 and Time 2 assessment. Perceived job demand, however, remained relatively stable between Time 1 and Time 2 for both samples although subjects from the publishing company reported higher scores.

In comparing gender differences in the distribution of job characteristics in the U.S., Karasek (1988) noted that women's average level of decision latitude is often markedly lower than those of men. Other studies have reported similar results (e.g. Wolf and Fligstein, 1979s, 1979b). Generally, psychological demands at work do not differ greatly for men and women although they appear higher for women. However, these findings mostly concern workers with job experience and thus do not apply to new job entrants, particularly graduates. The relatively short working experience of the graduate newcomer suggests it is unlikely that males have higher job positions which give greater work autonomy since, on the whole, few promotions would have been made in the course of the eight months or so since they started work. Thus, we do not know whether males are recruited into jobs which actually allow more discretion, whether they "take" more discretion regardless of what the job supposedly allows, or whether they perceive more discretion (than females) in the same objective situation. An examination of the publishing company data suggests that job level is not related to perceived job discretion. There was an approximately equal proportion of male (81.3%) and female (80.3%) subjects at middle management level and above. 51.7% of female subjects directly supervised other workers

compared with 68.8% of male subjects who were responsible for other employees. Nonetheless, males reported higher job discretion than females in this sample.

No gender differences were found in the locus of control (LOC) measures although job discretion was positively correlated with interpersonal locus of control for males (r = .22, $p \leq .05$). This might suggest some evidence for the explanation that males perceive more discretion than females under similar work situations. Thus, on the whole, it appears that males "take" as well as perceive more discretion than females in their jobs.

Gender and period at work showed mediating effects in the longitudinal analysis of Time 2 GHQ. The results (Table 5.8) showed that gender and length of work experience at follow up assessment were significant main term predictors when entered as demographic controls in the prediction of Time 2 GHQ. However, when neuroticism was included in the analysis (Step 2), gender and period at work were non significant in relation to GHQ. The conditions and tests for the presence of mediator variables were discussed in Chapter 4 (Section 4.6.4.5).

5.6.2 Social Support as a Stress Moderator

Results from the cross-sectional and longitudinal analyses demonstrate that interpersonal relationships moderated the deleterious effects of work stress. In particular, support from supervisors showed the strongest buffering effects providing greater attenuation of work-related stress. For instance, supervisor support x work discretion, was highly significant in the prediction of Time 2 GHQ compared with friends support x work discretion. Those with good supervisor relationships were relatively unaffected by changes in levels of work discretion and reported consistently lower GHQ or social dysfunction. This finding is consistent with previous studies reporting the protective value of supportive relationships at work (Etzion, 1984; Russel, Altmaier and Van Velzen, 1987; Solomon, Mikulincer and Avitzur, 1988; Wells, 1982) and in which supervisor support has been

found to be a major buffering source of job related demands (Karasek, Triantis and Chaudhry, 1982; Kirmeyer and Dougherty, 1988; Fusilier, Ganster and Mayes, 1987). The work stress literature generally indicates that not all kinds of support are equally helpful and that different sources of support are helpful in different ways. Results from the present study corroborate this view and extend upon it by suggesting that the meaningfulness of the support is also contingent upon timing.

A closer look at the pattern of buffering effects in the present study indicates that the way in which beneficial social relationships offer protection may depend on factors other than just matching "needs" with specific types of assistance. Analysis of the cross-sectional Time 1 data found considerably weaker work support (supervisor or coworker) moderation effects compared with non-work buffering relationships. In contrast, the Time 2 regression analyses revealed significantly stronger and more work support x work stressor interactions in the prediction of GHQ and job satisfaction. (Support from friends was the only non-work measure that showed a buffering effect on job discretion). This finding could be interpreted in terms of the context in which different sources of social support are meaningful at different periods. Thus, at initial assessment when subjects had just started working, non-work support sources could be more helpful in alleviating difficulties at work. As people perceive the availability of support resources differently, it appears that a lack of fit between *when* assistance is given and *when* it is sought (or needed) may be as important an issue as that concerning the matching of substantive types of support with specific needs (cf. Cohen and Wills, 1985). Behaviour reflecting emotional or instrumental assistance and intended to be supportive may be seen as helpful by the recipient if it is provided at the right time, or, it may be construed as unhelpful if provided at the wrong time. Studies of cancer patients have shown, for instance, that from the patient's perspective, the most appreciated kind of help in the early stages of illness is emotional support (Dunkel-Schetter and Wortman, 1982; Dunkel-Schetter, 1984). Other types of

assistance offered e.g. material help and information about other cancer patient's progress were not appreciated. Support which is "out of phase" is, therefore, ineffective (Duck, 1984).

One anomaly in the present data appears to be the decrease in supervisor support for males ($p \leq .025$) and females ($p \leq .07$) at Time 2 assessment. In addition, there was a marginal decrease in coworker support for females ($p \leq .07$). In the cross-sectional analyses, supervisor support showed a main effect in the prediction of Time 1 GHQ, $F(1,109)=9.18, p \leq .01$, (Table 5.6), and a (weaker) main effect, $F(1,109)=4.54, p \leq .03$, at Time 2 (Table 5.7). However; no interaction effects for supervisor support x job demand or job discretion were found in the Time 1 analysis whereas supervisor support x discretion was significant in the cross-sectional analysis of Time 1 GHQ and longitudinal analysis of Time 2 GHQ. The decrease in supervisor support between assessments may reflect developmental phases underlying the interpersonal relationship process. The initially higher support reported by subjects may be partly due to "halo" effects as supervisors are perceived by the subjects as being more supportive because senior staff may show greater concern during the initial period when the newcomers are settling in. After the induction phase, when the new workers begin to get to know their supervisors better, the interpersonal relationships may shift to a different level of understanding and communication which may indicate a more "realistic" level of reported support. As the new worker proceeds through the transitory stages, interpersonal relationships with supervisors and colleagues may further develop and stabilize. The Time 1 and Time 2 assessments may reflect the initial and settling in phases of the transition, before strong social bonds between supervisors, colleagues and workers are fully established.

As the individual progresses through the transitory stages, changes in the work situation may result in less time for social interactions with friends and other non-work sources of contact. Furthermore, the effects of social support may be delayed in that while

the beginnings of affiliative attachments with supervisors and coworkers develop at Time 1, it is not until Time 2 that the moderating influence of interpersonal relationships become apparent. One obvious explanation for the reliance on support from partner and friends is that it takes time for new workers to develop affiliative relationships with colleagues and supervisor(s) which provide feelings of trust, belongingness and security. The significance of such supportive networks become apparent once established, and work support, which serves a self-esteem enhancing function, then displace non-work resources as the key factor in moderating job stressors. Results from the longitudinal analyses (Table 5.8) in which relationships between work and social support and psychological health were examined while controlling for initial levels of all these variables, provide strong evidence indicating the beneficial effects of supportive relationships that supervisors can provide in ameliorating work stress. The moderating effects of supervisor support were sufficiently robust when tested using the conservative "omnibus" regression approach. Overall, the findings provide substantive evidence for the buffering hypothesis and replicates the earlier results in the first study.

5.6.3 Work Stressors - Job Demand and Job Discretion

The zero-order correlations indicate that perceived job demand was not correlated with either of the mental health indices or job satisfaction. No "main effects" of job demand were found in any of the cross sectional and longitudinal analyses. Job discretion, however, showed strong inverse relationships with GHQ, social dysfunction and job satisfaction, and was highly significant when entered as a main term predictor. Tests for curvilinear relationships between work-related demands and social support in the prediction of GHQ showed no significant interaction effects.

An examination of the demographic and personality attributes of this sample revealed higher locus of control scores compared to the entrepreneur sample, as well as the sample of white-collar workers in the publishing industry (the locus of control construct

was assessed by means of the Paulhus Spheres of Control scale in all three samples). Furthermore, the nature of the graduate sample is such that they have high educational attainment at the university level (see Section 5.5) and it is likely that they also possess a higher all-round educational background than subjects in the first study. (A summary of the mean scores for the work, personality and health outcome variables are given in the appendix). These factors may account for the observed relationships between discretion at work and psychological health. The significant interaction between demand and discretion is generally consistent with the Karasek hypotheses although Figure 5.11 showed that high discretion/high demand, rather than low discretion/high demand, was predictive of the highest GHQ scores.

5.6.4 The Johnson-Hall Demand-Control-Support Model of Work Stress

The Johnson-Hall three-dimensional model of work stress specifies four possible interactions[11] of job demand, job discretion, and social support in the prediction of health-related outcomes. The model indicates that the "highest" psychosocial risk factor is associated with low discretion, low support, and high demand. Conversely, the predicted "lowest" risk factor is among workers with high discretion, high support, and low demand. The present study found significant three-way interactions in the Time 1 (partner support x demand x discretion) and Time 2 (supervisor support x demand x discretion) data but not in the longitudinal analysis. The form of the interactions from the Time 1 (Figure 5.2, Figure 5.3) Time 2 (Figure 5.6, Figure 5.7) analyses are summarised in Table 5.12.

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11. The four interactions are: demand x discretion, discretion x support, demand x support, and, demand x discretion x support.

Table 5.12 Summary of 3-way Interactions Between Demand, Discretion and Partner Support (derived from Figure 5.2, Figure 5.3, Figure 5.6, & Figure 5.7)

Theoretically Predicted Risk Groups	
Lowest Risk Group	**Highest Risk Group**
High Discretion/High Support/Low Demand	Low Discretion/Low Support/High Demand
Observed Relationships In Present Studies	
Low GHQ Group	**High GHQ Group**
I. Time 1 Analysis: Partner Support	
A1.High Discretion/High Support/Low Demand	F1. High Discretion/Low Support/Low Demand
B1.High Discretion/High Support/High Demand	G1.Low Discretion/Low Support/High Demand
C1.High Discretion/Low Support/High Demand	H1.Low Discretion/High Support/Low Demand
D1.Low Discretion/Low Support/Low Demand	
E1.Low Discretion/High Support/High Demand	
II Time 1 Analysis: Supervisor Support	
A2.High Discretion/High Support/High Demand	E2. High Discretion/High Support/Low Demand
B2.High Discretion/Low Support/Low Demand	F2. High Discretion/Low Support/High Demand
C2.Low Discretion/High Support/High Demand	G2.Low Discretion/Low Support/Low Demand
D2.Low Discretion/High Support/Low Demand	H2.Low Discretion/Low Support/High Demand

The results of the Time 1 and Time 2 data (Figure 5.2, 5.3, 5.7) indicated that variations in job demand were not related to GHQ for those with high discretion and high support. Thus, Table 5.12 shows that the combination of interactions represented by A1, G1, and H2 replicate the theoretically predicted lowest and highest risk groups specified by the Johnson-Hall model. With the exception of these 3 interactions, the other combinations show varying degrees of association with GHQ but not always in the expected direction. It is worth noting that whilst the 3-dimensional model indicates that the highest psychosocial risk factor is associated with low discretion, low support and high demand, other combinations of the three factors may also be indicative of high, although not necessarily the highest, GHQ. For instance, in B1 and A2, high discretion and high

support may offset the negative effects of high demand and the interaction set would still be significantly associated with lower GHQ although the high discretion, high support, *low demand*, interaction theoretically predicts the lowest risk of ill health. The five interaction terms described in B2, C1, C2, D1, E1, E2, F1, and H1, however, indicate considerably weaker evidence for the model since only one variable in the interaction set corresponds to that hypothesized by the model. In E2, the highest risk combination of factors would, theoretically, be determined by low discretion, low support and high demand although the results in the present study indicated that *high* discretion, *high support*, and *low demand*, was related to higher GHQ.

In a recent investigation of the relationships between work environmental factors and physical health among Swedish workers, Johnson and Hall (1988) reported that high job discretion, low work support, and high demand was associated with the *highes*t risk of cardiovascular disease (CVD). This unexpected finding corresponds to the F2 combination in Table 5.12. Johnson and Hall suggest that the modifying effect of job discretion on the job demand and CVD relationship as being contingent on the presence of good supportive work relationships. The data from the present study supports this interpretation. Of the seven combination of interactions shown under the high GHQ group, five of the interactions included a low social support dimension. Furthermore, in the Time 2 analysis, high supervisor support was evident in three of the four observed interactions which predicted low GHQ. It is worthwhile noting that the significant interaction from the Time 2 data concern work-related support and therefore provides more substantive evidence of the predictions made by the Johnson-Hall model than the non-work, partner support x demand s discretion interaction found in the Time 1 analysis.

Unpredicted cross-over interaction effects indicating higher symptomatology for those with higher levels of social support and lower stress have also been reported by other investigators (e.g. Cohen and Hoberman, 1983; Kaufmann and Beehr, 1989). Some writers

suggest that these reverse or negative buffering effects may be due to methodology problems although no adequate explanations have yet been offered.

There are two aspects of the graduate sample which may help explain the direction of the demand x discretion x support interactions in relation to psychological well-being. First, the results from the cross-sectional and longitudinal analyses suggested that job discretion was a more important determinant of mental health among the graduates. This finding, together with the generally higher educational attainment of the graduates suggests that the level of demand may be too low and hence show adverse rather than positive effects on psychological well-being. A combination of high discretion, high support and medium level of demand may be the "best" overall predictor of mental health in the present sample.

Second, 96.7% (n =117) of the subjects were single although the total response for the spouse/partner measure of social support was 69.2% (n = 84). Thus, 95.2% (n =80) of the majority of spouse/partner support were from a close, confiding relationship with a boyfriend or girlfriend. Whilst such relationships certainly provide feelings of attachment, security and supportiveness, it also offers opportunities for conflict. Problems concerning partner relationships may be more likely to occur among the younger age group because of changing individual needs, motivations and career ambitions. Further, the change in status from adolescence to worker with its new identity, status and responsibilities may add to the demands experienced by the couple. It is uncertain whether support solely from partners in a young age group sample may make any difference to the direction or quality of the usual stress-buffering effects of support reported in the literature.

On the whole, the results partially corroborate some of the predictions of the Johnson and Hall demand-control-support model. Although the graphical representation of the interaction effects for partner support were not always in the predicted direction, some of the interaction effects are nevertheless consistent with Johnson's hypotheses that high discretion, high support and low demand are indicative of lowest risks to impaired

psychological functioning. Similarly, a combination of low work discretion, low social support and high work demands are associated with poorer mental health. Previously, evidence for the three-way interaction has not been demonstrated, except by Johnson and Hall (1988) in a large-scale study of the relationships between the psychosocial work environment and cardiovascular disease.

5.6.5 Some Implications for the Design of Jobs

The findings from the present study emphasized that social support is a significant factor in the evaluation of the relationship between work stress and psychological well-being. The results also draw attention to the importance of work discretion in the links between stress and illness. Job demands, on the other hand, showed weaker associations with health-related outcomes, and the strongest two-way interactions were observed between discretion and support. However, neither support nor control by itself is sufficient to moderate the impact of job demands. Thus, all three factors are interconnected. In considering the implications this may have for improving occupational health in the work setting, it might seem easier to start with social support mainly because although task characteristics can be altered to provide more or less job discretion and work load, organizational and situational constraints can make such approaches to job redesign difficult to implement. The present findings and the previous study (Chapter 4) indicates that work supervisors and coworkers play a greater role than nonwork sources of support in reducing occupational stress and alleviating its effects on mental health. The focus of enhancing well-being through social networks and supports should be directed at those persons who, by virtue of their organizational positions (e.g. managers, supervisors), have direct contact with their workers. One way to effect this is to build into the work or work setting, conditions which facilitate social interaction and communication. Supervisors can only be effective sources of support if they are accessible to their workers and similarly for coworkers. Jobs which physically isolate workers reduce social interaction although such

conditions of isolation are not unique to factories or manufacturing plants as white collar workers (e.g. police officers on patrol, clerical workers) may also experience social isolation in which they have little opportunity to communicate with peers.

In considering the question of job redesign from the work characteristics approach, it would seem that providing the worker with greater autonomy over work tasks, or reducing psychological workload could well enhance health outcome. However, Broadbent (1985) noted that although empirical findings generally indicate that high job demands, low discretion, and low social support show adverse effects on health, the relationships between job characteristics and symptomatology are specific to the context of the work group and that different features of the job may have different effects on health. More importantly, job redesign, if it is to be effective, has to consider carefully the motives of the workers in which it is aimed at.

5.6.6. Negative Affectivity, Perceived Demand and Psychological Health

Recently, researchers in the field of health psychology have been concerned over the potential spurious effects of negative affectivity (NA) in affecting stress-health outcome relationships (Costa and McCrae, 1987; Brief et al, 1988). The present study found some evidence for the argument that NA, assessed by neuroticism, inflates the strength of the relations between psychological symptoms and measures of perceived support and work. However, consistent with recent findings (Brief et al, 1988; Parkes, 1990), the significant partial correlations for interaction effects remained when controlled for neuroticism.

The magnitude of the inflationary effect of neuroticism was, on the whole, fairly consistent except for the (Time 2) additive effects of work and social support variables in predicting (Time 2) GHQ for the longitudinal analysis. When the Time 1, Time 2 regressions controlled for NA, the total amount of variance accounted for by the work and social support variables was about 15% to 20% less. In the longitudinal analysis, the R^2

increment to the model contributed by Time 2 work and support measures (Table 5.8) was .124 (22.9%) when NA was included in the regression compared with .131 (26%) without NA in the model. These findings suggest that the inflationary effect of NA are not as large as that reported by Henderson, Bryne and Duncan-Jones (1981), or Payne (1988) in which he indicated that the effect of including trait neuroticism in a regression model was to nullify the significant predictive effects of other work environment variables in the prediction of GHQ.

There was some evidence that neuroticism acted as a moderator variable in relation to work discretion. Significant interaction effects were found in the prediction of Time 1 and Time 2 job satisfaction but not for GHQ or social dysfunction. These results are consistent with recent findings reported by Parkes (1990) in which high NA (as assessed by the 23-item neuroticism scale of the Eysenck Personality Questionnaire, 1975) subjects were found to respond with higher levels of affective distress when work demands were high. Other researchers have also found evidence for the moderating role of neuroticism in relation to social and psychological stressors (e.g. Denney and Frisch, 1981; Parasuraman and Cleek, 1984). The present studies indicate that there are two ways by which neuroticism may influence the stress-outcome relationship: (i) as a potential confounding factor; (ii) as a moderator variable.

Given that measures of the relationships between perceived stress and psychological health are indeed inflated by neuroticism, there is a need for investigators to insure that statistical controls are incorporated in the analysis of such data, and in particular, self-report assessments of the work environment and health outcome. This view is emphasized in a recent investigation of the NA problem, in which Watson and Pennebaker (1989) examined different types of health outcome measures in relation to NA and concluded that NA is a problem in health research as it acts as a confounding factor in the stress-health outcome relationship.

5.6.7 Individual Differences in Reactivity to Work Stress

There is some controversy concerning whether personal resources e.g. hardiness, Type A behaviour pattern, self-esteem, locus of control, moderate the relationship between stress and disorder. Some investigators have argued that except for locus of control, there is generally little convincing evidence for personality factors operating as stress buffers (Cohen and Edwards, 1989). The present findings provide some support that personal efficacy LOC influence stress appraisal and psychological adjustment. Locus of control was assessed only at Time 1. The scores for the LOC measure ought to be relatively stable over time although there were significant changes in levels of work and social support between assessments.

The results showed a moderating effect of locus of control on work discretion in relation to Time 1 GHQ. For internal LOC subjects (Figure 5.12), GHQ showed an inverse relationship with job discretion, high GHQ being associated with low job discretion. The high discretion-high LOC (internals) group indicates congruence and is associated with better mental health. A congruence effect is also evident for the combination of low discretion-low LOC (externals) individuals. For external LOC individuals, GHQ was positively related to job discretion. One interpretation is that since internals are characterised by their beliefs in being able to direct their own "fate" and influence outcomes, the lack of job autonomy may be regarded as conflicting with their control beliefs resulting in a higher level of distress. In contrast, externals suffer less from the lack of decision latitude simply because their personal orientation is unrelated to the need to be in control. Indeed, the interaction effect shown in Figure 5.12 indicates that a high level of discretion is associated with a higher level of GHQ.

Warr (1987) noted that there is a lack of empirical evidence for congruency effects although some evidence of congruency in work situations have been reported (Marino and

White, 1985; Parkes, 1984). The present finding is consistent with the general research literature and provides further support for the congruency model of personal control.

Overall, the present study demonstrated that personality factors interact with the psychosocial work environment to influence occupational health outcomes. Specifically, the personality characteristics of internal locus of control and extraversion are associated with greater levels of perceived social support; these factors, combined with high work discretion, are associated with better mental health and less work strain (as assessed by job satisfaction scores). Research that investigated personality and social resources in mitigating the effects of stress have found that the personality characteristic of hardiness, one aspect of which is internal LOC, and social support operate as stress buffers (Kobasa and Pucettti, 1984). In their study of management executives, Kobasa and Pucetti, for instance, reported that those who perceived support from their supervisors showed lower illness scores than those who perceived no support. Hardiness is a constellation of personality dimensions (Kobasa, Maddi, and Kahn, 1982) and it may be potentially worthwhile investigating some of the attributes defined by the hardiness concept and its relationships with perceived support.

The present study offers a further perspective concerning individual differences in the reactivity to work stressors. Work preferences relating to "esteem/social" characteristics of the job (Factor 1) showed main effects in the prediction of GHQ but not preferences concerning "work routines" (Factor 2). In other words, differences between preferred and actual job in relation to task attributes associated with the physical work environment, work hours etc. were relatively less important than characteristics of work that provided opportunities for social interaction, personal challenge and achievement. However, both factors moderated the effects of job demand and social support in relation to GHQ. The form of the interaction in Figure 5.14 suggests that although individuals may often prefer jobs that are intrinsically satisfying, large amounts of these job characteristics

(low Factor 1) combined with a high level of job demand may in fact lead to unfavourable health outcomes. On the other hand, there may also be detrimental effects to health for those who seek "less" challenge, opportunities for achievement and prefer work situations that are predictable. The interaction effect in Figure 5.13 indicates that high amounts of work routine factors (i.e. low Factor 2) and low job demand is associated with higher GHQ. It was noted earlier that too low a level of job demand may, in combination with work discretion and support resources, lead to unfavourable health outcomes. This is particularly true of the present sample of subjects. The present findings from the analysis of the discrepancies between preferred versus actual job characteristics (i.e. what the real world of work is really like) suggest that a "good" fit moderates work-related demands and is positively associated with psychological functioning. Young people making the transition from education to work experience a certain degree of unease and what Hughes (1958) called "reality shock". Part of the experience of this "reality shock" may be due to the discrepancies between personal expectations of what the job entails and what the work is really like.

Chapter Six

General Discussion and Conclusions

6.1 Introduction

The present work set out to elucidate relationships between social support, individual differences, and mental health in the context of the work environment. Four main areas of investigation within this general theme were outlined in Chapter 2 and formed the basis of the studies. To recapitulate, the studies were concerned with: (i) individual differences in social support; (ii) the relation between personality factors and mental health; (iii) the mitigating effects of personality factors and social support on workplace demands; (iv) the joint interactive effects of job demand, work discretion and social support in the prediction of psychological well-being.

The purpose of this chapter is to consider the extent to which the present research achieved its objectives, to note limitations in the studies, and to indicate areas for further work. The discussion will deal with findings from both studies in relation to individual differences and social support in mitigating the effects of work stress on psychological health. More specifically, the results are discussed in the following order: (i) social support and mental well-being; (ii) personality factors and social support; (iii) the sequencing of stressors and social resources; (iv) environmental work factors and well-being; (v) work stress among self-employed individuals and small business men and women; (vi) individual differences in personality in relation to work stress.

As noted in Chapter 2, much of the earlier work on social support was concerned with establishing the beneficial effects of good interpersonal relationships on psychological and physical well-being. Researchers focused on how emotional or instrumental help could mitigate the effects of work stressors or life events. Social support generally accounts for

about 5 to 10 per cent of the variance in mental health variables such as anxiety, depression and somatic complaints, although the effect sizes are larger for job-related outcomes e.g. work adjustment, job satisfaction (Ganster & Victor, 1988). Although the amount of variance explained by social support is not large, the consistency of the effects reported in the literature provides evidence that there is indeed a genuine relationship between supportive interpersonal relationships and well-being. Subsequent work has produced a more differentiated view of support suggesting that the way in which social relationships mitigate stress depends not only on the type of available social resource but also on person and situational factors. In the light of this new perspective, the present work examined two potentially important areas that might further our understanding of social resources that mitigate stress and also increase the predictive value of the social support concept. These two issues concern: (i) interactions between personality and specific types of support in predicting well-being; (ii) how different kinds of support may be helpful for specific situations or needs. Research has also shown that as workplace demands increase and individual control decreases, strain and ill health may result (Karasek, 1979). Thus, in order to obtain a more complete picture of stress at work, the present investigations explored the joint effects of social support, job demands and work control on mental well-being.

6.2 Social Support and Psychological Well-Being

Consistent with the literature, the present findings showed that perceived social support and work-related demands were associated with mental well-being, as measured by the GHQ. The literature review in Chapter 2 highlighted the controversy surrounding the main-effect versus stress-buffering model of social support. Recently, Ganster and Victor (1988) concluded that the buffering hypothesis does not receive very strong confirmation in the occupational stress literature because of methodological limitations (e.g. the use of cross-sectional research designs and self-report measures of work stressors) in many investigations of work stress and social support. However, they also noted that

methodological shortcomings do not provide ready explanations for the frequent failure to discover buffering effects for social support.

In this context, it is important to note that both the studies reported here provided evidence for the social support buffering hypothesis. Although results from a longitudinal study were more definitive than the retrospective data in the first study, there was evidence that supportive relationships moderated work stressors in relation to psychological health. Furthermore, as cross-sectional designs are not particularly well-suited to detecting the buffering effects of social support, significant interactions, when present, truly reflect conditioning effects (House, 1981). The second study used a longitudinal design and investigated the impact of a major life transition on responses to work stress. The empirical evidence provided for the buffering effects of support is considerably stronger than the findings from the first study, and therefore may be regarded as a strong contribution to the main effect versus stress-buffering controversy as far as functional measures of support are concerned.

In addition, the findings suggest an explanation for the lack of empirical evidence for the buffering hypothesis noted by Ganster and Victor (1988). It appears that not all types of support resources may reveal moderating effects. For instance, those with good, non-work supportive relationships (as measured by the ISEL) showed better psychological health (GHQ scores) under conditions of high stress whereas no moderating effect of work-related social support was evident. Conversely, only workplace support buffered the effects of job stressors in the prediction of job strain, assessed by means of a three-item measure of work satisfaction; non-work, global support showed no such moderating effects. This differential effect may be interpreted in terms of Cohen and Wills (1985) "need-specificity" hypothesis, in which there must be a match between the needs elicited by a stressor and the available support resources in order to obtain a stress-buffering effect. Work and non-work support are different types of support resources and their buffering effects on stress depends

on whether "needs" (e.g. working relationship problems with boss) and "support" (e.g emotional support from coworkers) match. The processes by which social support and health are related in the workplace thus differ from those involving non-work, stressful episodes or life-events. Thus, the failure to discover main and/or buffering effects may be due to a "mismatch" of support resources with the needs of the person under conditions of stress.

Cohen and Wills also proposed a more general matching hypothesis in which there are global social resources (e.g. appraisal support, esteem support) that are helpful in confronting a wide range of stressors. The ISEL was conceived as a measure of global support. While the results (from Study 1) confirm the "need-specificity" model, the absence of any significant interaction effects for work stress x ISEL in the prediction of job strain indicates that the global aspect of the matching hypothesis is not supported in the present investigation. A limitation of the present studies is that there was no opportunity to examine this global matching hypothesis further since the ISEL was not used in the second investigation. Data from a longitudinal study would have provided a good test of Cohen and Wills's idea of an all-encompassing social support resource.

6.3 Individual Differences and Social Support

Although research that use functional measures of social support are based on cognitive appraisal models (Lazarus, 1966; Lazarus and Folkman, 1984), there appear to be few or no published studies that have directly investigated the influence of personality factors in the perception of social support. Perhaps research that is most closely related to personality traits in the appraisal of support is the work reported by Sarason, Sarason, and Shearin (1986). They examined the stability and origins of social support as well as differences in social competence and behaviour among high and low support individuals. Researchers have tended to focus on either the effects of gender (Fusilier, Ganster and

Mayes, 1986; Ross and Cohen, 1987) or personality factors that (further) moderate the buffering effect of social resources on work stressors (Caldwell, Pearson and Chin, 1987; Lefcourt, Martin and Saleh, 1984). Eckenrode and Gore (1981), and Ganster and Victor (1988) have pointed out the need to pay closer attention to the context and meaning of social support; that is, exploring how social support is perceived as a function of the person, and the timing of delivery. In the first study, personality factors were used to predict perceived support. The results demonstrated that consistently higher levels of perceived availability of support were associated with a combination of positive nAch, trait extraversion, and internal locus of control.

This suggests that some personality factors e.g. locus of control may operate in either or both of two ways, to moderate social support in relation to stress, and to influence social support through the perceptions of the person. The results from Study 1 illustrate how the appraisal of support was predicted by the interactions between locus of control and nAch, and, locus of control and extraversion. The cognitive stress model indicates that perceived stress occurs when perceived demands exceed perceived resources, that is, when people find events threatening or otherwise demanding, and at the same time, find their coping resources inadequate. Perceived social support, on the other hand, acts to mitigate feelings of stress because of its possible influence on the stress appraisal process. The key theme here is the appraisal process, and as Cohen (1988) noted, it is the belief that helpful others are available that is critical in the appraisal of whether events are stressful or harmless. Since the appraisal process is conceptually linked to individual differences, (see Chapter 1, House research paradigm), it is clear that personality characteristic play a significant role in determining the appraisal of support.

6.4 The Timing of Social Support

There were subtle differences underlying the buffering effects of social support over the Time 1 and Time 2 assessments in the longitudinal study. In addition to the types of support (work and non-work) that were found to have different moderating effects on perceived work demands, the results suggested that there was a temporal dimension to the protective effects of good supportive relationships. Pearlin (1985) noted that stressful situations unfold over time and that *"the same basic problem may evoke different supports as it moves through various stages and transformations."* (p. 47). Results from the separate analysis of Time 1 and Time 2 data are consistent with this sequencing of stressor and social support. Work (supervisor and coworker) support displaced non-work (partner or friends support) support in moderating job stressors at the second assessment. Thus, in addition to the finding that specific types of support resources should match the needs of the individual in order to be helpful, the timing of support is also an important factor, particularly in situations where major life transitions occur. In this respect, Kasl and Wells (1985) have argued that high social support can, in some circumstances, have negative effects on the recipient. They cite the case of recently unemployed persons whose strong social network inhibit rather than encourage their search for new work. Findings in the life-stress literature have also emphasized that the timing of support within a period of transition is a critical factor underlying its effectiveness and acceptability (Weiss, 1975; Parkes and Weiss, 1983). The issue of timing provides another perspective to the reverse buffering effect of support from friends on job demands, found in Study 1. It might be that the available support from friends was a deterrent to subjects to respond positively to the demands of work, and/or to seek to develop supportive relationships within the work setting.

Transitions necessitate adjustment on the part of the individual. During transitions, the person has to learn new ways of making sense of his environment and coping with it. Weiss (1975), and Parkes and Weiss (1983), for instance, showed that those who

experienced major life transitions such as martial separation or bereavement, take about a year to accept their loss emotionally and to develop a new view of their selves and society. Furthermore, it may be another two to three years before the individual consolidates their new image. The transition from education to work may not be as severe as say, bereavement. Nonetheless, the sequencing of stressors may be assumed to follow a similar pattern although the learning and adjustment period may be shorter than the time span indicated by the life-stress research literature. However, little is known about how long the transitional period takes for those beginning work before they firmly re-establish themselves in their work environment. Further work is needed in order to estimate this time-frame, and to discover concomitant changes in work factors, social support, and well-being that occur with the end of the transition. In assessing the fit between type of support and type of stressor (or need), it may be equally important to address the issue concerning the duration of the transition and how far the individual has progressed along it.

6.5 Environmental Work Factors and Well-Being

In the first study, it appeared that perceived job demand was more important than control in predicting GHQ. In contrast, work discretion showed a highly significant main effect on GHQ for the Oxford graduates sample, whereas this was not true of job demand. The different effects shown by the two work variables in the prediction of GHQ may be due to the characteristics of the sample. In the case of the Oxford graduates, control over work tasks seems to be more important than sheer quantity of work, possibly because of their higher expectations as a result of their educational attainment, and their need to be "in charge", reflected in the young graduates higher LOC scores compared with subjects in the first study (Table 3.4, Chapter 3).

The literature review in Chapter 2 noted that empirical evidence for the Karasek model is equivocal. In the present research, there was no evidence of a demand x discretion

interaction in the first study but a significant interaction effect was found in the second study (Figure 5.11, Chapter 5). Again, differences between subjects may underlie the inconsistency in the results relating to the Karasek model. The employee and small business enterprise groups in Study 1 were closer to a general population sample than the Oxford graduates who represented a more homogeneous group drawn from a university population.

The longitudinal analysis revealed three-way interactions between job demand, job discretion, and social support, confirming Johnson and Hall's (1988) model of work stress. Johnson (1986) argued that the addition of the social support dimension expanded the Karasek model to include personal and collective relationships between people as opposed to relationships between individuals and the job alone. It was noted in the discussion in Chapter five that support for the demand-control-support interaction has not previously been reported, except by Johnson and Hall in their investigation of occupational stress and cardiovascular disease among Swedish workers. The present findings concerning the specificity and timing of social support, described above, further qualify the mechanisms involved in the links between stress and illness; they suggest that social support may be more complex than just *"an opportunity to talk with other people"*, or as an "emotional" buffer between occupational stress and mental health. While a combination of high support, high discretion and low job demands may render people less susceptible to health risk, it is also important that the right type of support is available at the right time.

6.6 Work Stress and Entrepreneurs

The main contribution this study makes to our understanding of work and health among those operating small businesses is found in the data on their personality profiles and job characteristics.

The self-employed and small firms owners differed significantly from employees in need achievement (Table 4.3, Chapter 4). Employees were also less "internal" (locus of control) than either the self-employed or small firms owners. This finding is consistent with other studies in which nAch has been shown to be a distinguishing attribute of persons who have demonstrated success in jobs that are entrepreneurial in character (Ahmed, 1982; Durand, 1975; Nandy, 1973). Research on personality resources as vulnerability factors suggest that locus of control is one dimension of the "hardiness" concept (see Kobasa, 1979; Kobasa and Pucetti, 1983). Anderson (1977), for example, found that successful entrepreneurs who recovered from the effects of a major disaster which severely damaged their business were highly internal in their locus of control orientation and also used more direct, action-focused coping behaviours.

In the light of the relationship between personality factors and perceived social support discussed above, this might suggests that the entrepreneurial group[12] is more resilient to the harmful effects of work stress than their employee counterparts. Furthermore, the sample in Study 1 could well reflect a "survivor" population in that only those who were successful remained in their present occupations; unsuccessful entrepreneurs may have given up their business to become employees. Another interesting feature of the data is that there was no significant difference in neuroticism between males (mean=3.95, *sd*= 3.39) and females (mean=4.09, *sd*= 3.56). In contrast, the *t*-test revealed the expected difference between males (mean=3.68, *sd*= 2.52) and females (mean=5.56, *sd*= 3.46) in the employee sample ($p \leq .01$). It is likely that another distinguishing attribute

12. Combination of self-employed (n =18) and small firms owners (n = 34).

of those running their own business is a "stable" personality as reflected in the trait neuroticism, at least as far as women are concerned.

6.7 Individual Differences in Personality

One aspect of the present research was to explore the role of individual differences in personality and work preferences as moderators of the stress-health relationship. The analyses revealed that only locus of control showed any evidence of moderator effects. This finding is consistent with the conclusion drawn by Cohen and Edwards (1989) in their review of personality factors that might act as stress moderators. On the other hand, discrepancies between job preferences and the actual "reality of the human organization" (Schein, 1978) can have profound effects in the experience of stress as has been demonstrated in the relationships between work demands, job preferences, and mental health outcome.

The significance of personality factors in mediating the relationships between work stress and psychological health raises the issue of selection, that is, whether certain jobs attract certain people and people "select themselves into" or "select themselves out" of particular occupations. For instance, it is possible that Type A persons pick occupations which reinforce their need for control and a fast workpace. It is also likely that internal LOC individuals tend to leave jobs which do not provide much discretion. The retrospective study is perhaps more vulnerable to this problem because there are few controls, apart from the demographic characteristics relating to age, years of work experience, against the danger of "self-selection". The longitudinal study is more favourable in this respect in that the first assessment was carried out only four to six weeks after subjects had started work, thus the data obtained is considerably stronger in regard to the selection problem.

A further methodological issue which concerns both studies is that all the variables relating to work demands, social support and health outcomes were assessed by self report. Whilst most of the measures used were well-established scales with known psychometric properties and whose adequacy were further examined using factor analytic procedures (Chapter 3), the (House) work support scales used in the first study were single item measures. Thus, no coefficient alphas were available for these items. The magnitude of the effects observed for the work support measures may therefore be affected. However, the (alpha) reliabilities of the work measures of support were strengthened in the longitudinal investigation as the full version of the House scale was used. The reliance on self-report measures in the present research raises the question of common method variance. The problems associated with measurement bias arising from the use of questionnaire methods for data collection was discussed in Chapter 2. Two opposing views have been offered with regard to the common method variance problem. In reviewing research that used self-report measures of perceptions of jobs, work environments and affective reactions, Spector (1987) concluded that carefully developed instruments were generally resistant to the problem of common method variance. However, in a separate analysis, Williams, Cote and Buckely (1989) suggested that this was not so.

In the present studies, the main emphasis was on the moderating effects (rather than the main effects) of individual differences in personality and social support on work-related stressors. Strong two-way and three-way interactions were evident in the analysis which examined the relationships between perceived work environment and responses to work stressors. Common method variance is likely to inflate correlations between perceived stress-illness but it may not readily account for the observed complex relationships in the present findings. It is worth noting that the use of observer ratings and other independent measures of work and health outcomes would certainly strengthen future research.

Chapter 6

The role of negative affectivity (assessed by neuroticism) in stress research was examined in relation to the following questions: (i) Is negative affectivity a confounding factor in studies of work-related stress? (ii) Does negative affectivity moderate stress-outcome relationships? Consistent with the literature, the results showed that neuroticism does indeed inflate relationships between psychological health and work stressors but the magnitude of the inflationary effect was not as large as that reported by some researchers (e.g. Henderson, Bryne and Ducnan-Jones; 1981; Payne, 1988). In addition, neuroticism moderated job discretion but not job demand in relation to work satisfaction. A weak moderating effect of neuroticism on job demand ($p \leq .09$) was found in the prediction of GHQ. Taken as a whole, the present work suggests that neuroticism operates as a dual-acting mechanism in studies of work stress. More importantly, the results underscore the need to include measures of negative affectivity in future research.

6.8 Implications of the Present Research

Altogether, these results suggest important implications for occupational stress research, and more specifically, for work organizations in helping young people prepare for employment.

The findings on the timing of social support suggests that, apart from personality characteristics which shape the perception of available interpersonal relationships, it is also important to ascertain how the dynamics of social relationships influence the enactment and perception of support. Currently, researchers have tended to see social networks and relationships as given and fixed (Jacobson, 1986). Friendships and affiliative bonds, however, change and future work should examine how support resources are transformed or maintained.

A major limitation of the present research is the lack of a refined understanding of the meaning of social support at work. Perceived support was found to be a significant

factor in mitigating excessive work demands or lack work autonomy but it is not clear how affiliative bonds are formed in the workplace and how they function to modify or improve work conditions. Such knowledge requires descriptive investigations which would add further to the quantitative data already collected. Since social contacts are the basis for interpersonal relationships, data on social networks would provide another perspective on the multi-dimensionality of social support in relation to stress and health. The present studies suggest that these may be important topics for future research.

From a theoretical viewpoint, the findings indicate that there is an increasing basis for broadening the concept of social support to include individual differences in personality. The implication is that if personality factors are major determinants of social support, then community programmes and intervention strategies designed to increase interpersonal skills and supportive relationships may not be as useful or effective as they ought to be. However, further studies based on experimental designs are needed to provide more definitive conclusions concerning the role of personality factors in the stress-social support-health relationship.

While several factors may account for the high rates of turnover and absenteeism that often occur in the early stages of employment (Wanous, 1980; Porter and Steers, 1973; Bray, Campbell and Grant, 1974) the present findings suggest that there are a number of ways in which organizations can effectively help facilitate the induction of new recruits and therefore improve well-being. An obvious method is to reduce job-related demands but this might reduce challenge and make jobs monotonous or boring. For instance, there was evidence in Study 2 that some people indicated preferences for work that offered challenge, achievement and interest. The overall effect may result in lowered work satisfaction with subsequent adverse effects on mental health. Modifying task or work characteristics may not always be feasible because of organizational constraints. Furthermore, perceived stress

appears to be an inevitable component of the work situation because of individual differences in how people respond to their environment.

One important approach would be to make senior staff aware of how social support can be helpful for those beginning work, particularly during the new job entrant's first months of employment. As Cassel (1976) commented, *"it seems more feasible to attempt to improve and strengthen the social supports rather than reduce the exposure to stressors."* (p. 121). Social relationships appear more amenable to change during crises than do other types of factors such as personality traits or coping habits. In a sense, social support is not simply friendly encouragement but is also acknowledgement by others of the legitimacy and significance of the newcomer's role (Arnold, 1986). Some types of work necessary restrict interpersonal contact between employees. The meaning and importance of social interaction at work, at least for some people, have been highlighted in the results concerning individual preferences for particular types of work situations or environments, assessed by the Work Preferences Questionnaire. Modifying work conditions or redesigning the job to allow more accessible contact with others represents another potentially useful method of improving worker health through social interaction. The other aspect of job redesign is obviously to provide the worker with a greater degree of autonomy over work tasks.

Finally, the present findings as well as other empirical studies indicate that some people are either more vulnerable or resistant to work environmental demands in relation to specific types of occupations. This suggests that the adverse effects of poor person-environment "fit" on well-being may be effectively reduced if employers were to give greater attention to the types of demands made by particular jobs in the selection of employees.

Some data were collected on subject's intentions to stay in their jobs at the second assessment (Study 2). One aspect of further work that could be potentially useful, from a

theoretical as well as practical viewpoint, would be to focus on subjects who remained in their jobs, those who have changed jobs or occupations, and to examine levels of work demands, social support and mental health. A tentative prediction is that social support ought to stabilise given that subjects would have established their network of working relationships with colleagues and supervisory staff. It would also be worthwhile to assess personality factors again, particularly neuroticism and locus of control, as some studies have reported that organizations and job content have been found to modify personal control beliefs (e.g. Frantz, 1980; Kohn and Schooler, 1982; O'Brien, 1984b).

6.9 Summary and Conclusions

The present studies contribute to current knowledge concerning the relationships between social support, personality and work stress in a number of ways. First, the findings add to those studies reporting evidence of social support as a moderator of work stress. Second, the results suggest that personality factors determine, to some extent, how people view and make use of their support resources. Whilst it is reasonably well-established that social support can protect people from the harmful effects of some types of work stressors, the process by which this occurs is not a simple one as the present findings have shown.

Different types of social support showed different moderating effects on work stressors in relation to personal functioning. It appears that people make distinctions between work and non-work relationships that they regard as supportive. Thus, in the workplace, interpersonal ties involving supervisors and coworkers provide more specific and focused support for the person concerned than do other sources of support (e.g. spouse, friends). Outside the context of work, people tend to perceive their sources of support on a more "global" perspective, drawing upon a relational network that consists mainly of personal friends and family, with supervisor and coworker support assuming a less significant role in moderating the demands of day-to-day living. One implication of this is that conceptual distinctions between work and non-work support and the use of specific scales designed for their assessment could provide a clearer picture of what types of resources individuals draws upon in coping with stressful experiences. The research also draws attention to the need to further investigate the temporal sequence in which social support occurs as findings from the longitudinal study revealed that supportive bonds take time to develop and its helpfulness may therefore be delayed.

Decision latitude over work is now a well-documented stress modifier and has been identified as a cause of psychological strain in occupational health (Bromet, Dew, Parkinson and Schulberg, 1988; Karasek, 1979; Passmore and Friedlander, 1982). The

results from the present research are consistent with the body of literature which indicate that a combination of low work discretion and high job demands leads to strain and mental ill health. The findings also demonstrated that workers with poor social support and low decision latitude are more likely to report problems with their psychological health. However, too low a level of demand may also lead to unfavourable health outcomes, particularly for those with low social support. Indeed, work discretion and social support appear to be the more important determinants of psychological well-being; the combination of these two factors can offset the adverse effects of excessive job demands on health. Overall, the results provide support for Johnson and Hall's model of work stress although in some instances, the three-way interactions were not of the form predicted. Few or no previous studies have reported evidence for this relationship except for Johnson and Hall's work on cardiovascular disease.

With few exceptions, investigations of social support have generally omitted personality characteristics in their research framework. Caldwell and Reinhart (1988), Hobfoll (1985), Pearlin et al (1981) and others have argued that persons with certain personality styles may vary in their need for social interaction. The present findings reiterate the importance of extending social support to include individual differences in future research.

Finally, analysis of the psychometric characteristics of the measures of work, personality and health outcome showed that the scales used in the present studies possessed sufficient alpha reliabilities and were psychometrically adequate. Whilst definitive conclusions cannot be made in view of the non-experimental nature of the investigations, on the whole, the data presented in this thesis do provide empirical evidence for the observed relationships between individual differences, social support, work demands and psychological health.

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Appendix I

Factor Analyses of Questionnaire Measures

Factor Analysis of Psychometric Scales

Eigenvalues, Commulaties, and Factor Loadings of Varimax Rotated Factor Matrix for 2 Factor Solutions for Scales Reported in Chapter 3.

Table A-1

Measure: Eysenck Personality Questionnaire (EPQ) (Study 1, N = 117)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
EPQ1	.27425	1	4.84512	20.2	20.2
EPQ2	.34071	2	2.80337	11.7	31.9
EPQ3	.23566				
EPQ4	.47735				
EPQ5	.16031				
EPQ6	.27008				
EPQ7	.24331				
EPQ8	.28434				
EPQ9	.42497				
EPQ10	.24213				
EPQ11	.38763				
EPQ12	.39896				
EPQ13	.29213				
EPQ14	.54880				
EPQ15	.31303				
EPQ16	.27307				
EPQ17	.34868				
EPQ18	.10765				
EPQ19	.34013				
EPQ20	.39893				
EPQ21	.34660				
EPQ22	.32434				
EPQ23	.22109				
EPQ24	.38885				

Table A-2

Measure: Eysenck Personality Questionnaire - EPQ (Study 1,N = 117)

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
EPQ14	.72583	- .14821
EPQ4	.68176	- .11205
EPQ20	.63540	- .00934
EPQ12	.63116	.02452
EPQ24	.62165	- .04900
EPQ22	.56994	.00379
EPQ2	.53729	.22812
EPQ16	.51397	- .06114
EPQ6	.49409	- .16110
EPQ8	.49146	- .20691
EPQ10	.46292	- .16683
EPQ18	.32588	.03801
EPQ9	- .18845	.62406
EPQ17	- .06399	.58702
EPQ19	- .09251	.57582
EPQ13	- .10046	.53107
EPQ15	- .20174	.52155
EPQ11	- .34049	.52124
EPQ1	.07488	.51831
EPQ7	.03475	.49709
EPQ21	- .32077	.49367
EPQ3	- .01303	.43527
EPQ23	.07500	.46418
EPQ5	.067587	.39556

Table A-3

Measure: Eysenck Personality Questionnaire (Study 2, N = 121)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
EPQ1	.29761	1	4.12566	17.2	17.2
EPQ2	.46830	2	2.39344	10.0	27.2
EPQ3	.21034				
EPQ4	.49988				
EPQ5	.17731				
EPQ6	.05455				
EPQ7	.30317				
EPQ8	.07648				
EPQ9	.21336				
EPQ10	.21060				
EPQ11	.30472				
EPQ12	.31324				
EPQ13	.50402				
EPQ14	.48920				
EPQ15	.22745				
EPQ16	.14240				
EPQ17	.15268				
EPQ18	.19379				
EPQ19	.26679				
EPQ20	.27267				
EPQ21	.13231				
EPQ22	.49604				
EPQ23	.07609				
EPQ24	.43510				

Table A-4

Measure: Eysenck Personality Questionnaire (Study 2, N = 121)

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
EPQ4	.70639	- .02987
EPQ22	.70406	- .01829
EPQ14	.69933	.01167
EPQ2	.68008	.07612
EPQ24	.61825	- .22992
EPQ12	.55009	- .10316
EPQ20	.50813	- .12031
EPQ10	.45115	.08408
EPQ18	.43492	- .06805
EPQ16	.31436	- .20876
EPQ8	.25322	- .11117
EPQ6	.22819	- .04974
EPQ13	- .07975	.70545
EPQ7	.00502	.55059
EPQ1	- .13058	.52968
EPQ11	- .15612	.52948
EPQ19	- .11200	.50423
EPQ15	- .07578	.47085
EPQ9	- .01386	.46171
EPQ3	- .13977	.43739
EPQ5	.01854	.42127
EPQ21	- .07312	.35632
EPQ17	- .25116	.29933
EPQ23	.07479	.26552

Table A-5

Measure: Paulhus Spheres of Control Scale (Study 1, N = 117)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
SOC1	.31438	1	4.44939	22.2	22.2
SOC2	.16145	2	1.24623	6.3	28.5
SOC3	.28351				
SOC4	.27007				
SOC5	.29743				
SOC6	.15631				
SOC7	.09459				
SOC8	.41329				
SOC9	.09147				
SOC10	.44357				
SOC11	.16341				
SOC12	.14103				
SOC13	.18588				
SOC14	.41245				
SOC15	.24706				
SOC16	.36598				
SOC17	.39934				
SOC18	.58473				
SOC19	.29557				
SOC20	.37359				

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
SOC18	.76444	.01917
SOC10	.65960	.09216
SOC14	.63436	.10016
SOC17	.61932	.12564
SOC16	.56401	.21881
SOC20	.55798	.24950
SOC15	.48336	.09253
SOC4	.48013	.19886
SOC3	.42363	.32249
SOC11	.40151	.04689
SOC2	.38950	.09869
SOC7	.26915	.14883
SOC8	.09348	.63605
SOC1	.14593	.54138
SOC19	-.13169	.52747
SOC13	.10975	.41694
SOC5	.37255	.39829
SOC6	.23837	.31621
SOC12	.24429	.28522
SOC9	.10455	.28379

Table A-6

Measure: Paulhus Spheres of Control (SOC) Scale (Study 2, N = 121)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
SOC1	.20577	1	2.70945	13.5	13.5
SOC2	.18358	2	1.16526	5.8	19.4
SOC3	.14449				
SOC4	.21432				
SOC5	.32650				
SOC6	.03742				
SOC7	.11195				
SOC8	.23176				
SOC9	.06527				
SOC10	.26517				
SOC11	.04405				
SOC12	.05596.				
SOC13	.06456				
SOC14	.25850				
SOC15	.20895				
SOC16	.35970				
SOC17	.39629				
SOC18	.41274				
SOC19	.11203				
SOC20	.14820				

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
SOC18	.64081	.04582
SOC17	.59425	.20775
SOC16	.59050	.10491
SOC10	.51049	.06761
SOC14	.50838	.00713
SOC4	.48912	.05078
SOC2	.42803	.01927
SOC15	.39273	.23390
SOC6	-.18521	.05580
SOC10	.16433	.54726
SOC11	.07770	.47510
SOC12	-.02494	.45293
SOC13	.11901	.36100
SOC14	-.02443	.33381
SOC15	.21326	.32049
SOC16	.15382	.29714
SOC17	-.07834	.24318
SOC18	.03924	.23327
SOC19	-.13933	.21249
SOC20	.13472	.21249

Table A-7

Measure: Work Preferences Questionnaire (N = 634)

Form A: "Preferred Work/Task Characteristics" (26 items)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
A1	.22423	1	4.77290	18.4	18.4
A2	.24304	2	2.37517	9.1	27.5
A3	.13365				
A4	.34107				
A5	.16935				
A6	.13071				
A7	.22123				
A8	.32498				
A9	.38315				
A10	.34690				
A11	.29668				
A12	.29203				
A13	.49024				
A14	.29826				
A15	.19730				
A16	.33446				
A17	.28713				
A18	.35089				
A19	.23403				
A20	.09985				
A21	.30325				
A22	.37153				
A23	.05939				
A24	.30159				
A25	.39387				
A26	.31924				

Table A-8

Measure: Work Preferences Questionnaire (N = 634)

Form A: "Preferred Work/Task Characteristics" (26 items)

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
A13	.66359	- .22336
A9	.61533	- .06723
A4	.57902	.07615
A18	.57087	- .15812
A11	.54163	.05765
A17	.53042	.07608
A8	.52613	.21947
A12	.47222	.26275
A10	.44698	.38355
A24	.44584	.32064
A26	.44380	.34969
A2	.43611	.22989
A19	.43341	.21492
A1	.43328	- .19106
A6	.35418	.07262
A3	.33833	.13850
A20	.31289	- .04413
A23	.21616	.11256
A25	.00354	.62758
A22	- .00363	.60952
A16	.09377	.57067
A14	- .15481	.52375
A21	.21458	.50716
A7	- .08583	.46245
A55	.25555	.36331
A5	.22770	.34279

(Factor 1 Labelled: "Esteem-Social" Factor; Factor 2 Labelled: "Work Routine")

Table A-9

Measure: Work Preferences Questionnaire (N = 634)

Form B: "Actual Work/Task Characteristics" (26 items)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
B1	.17284	1	5.01816	19.3	19.3
B2	.19146	2	1.50404	5.8	25.1
B3	.12416				
B4	.51501				
B5	.21086				
B6	.27711				
B7	.39530				
B8	.11695				
B9	.16677				
B10	.10653				
B11	.12578				
B12	.19881				
B13	.26432				
B14	.25586				
B15	.43491				
B16	.45511				
B17	.24480				
B18	.15871				
B19	.07020				
B20	.16899				
B21	.13546				
B22	.17646				
B23	.33102				
B24	.50105				
B25	.32125				
B26	.40270				

Table A-10

Measure: Work Preferences Questionnaire (N = 634)

Form B: "Actual Work/Task Characterlstics" (26 items)

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
B4	.71623	- .04499
B24	.69814	- .11681
B16	.66403	.11905
B15	.65826	.,04001
B7	.62180	- .09311
B26	.61432	.15908
B13	.51121	.05460
B23	.46168	.34333
B17	.45129	.20282
B5	.44934	.09370
B2	.42401	.10806
B22	.41917	.02746
B9	.38136	.14608
B11	.34988	.05795
B3	.34033	.09129
B10	.32441	- .03588
B21	.26487	.25555
B19	.19368	.18079
B6	.01693	.52614
B14	- .25100	.43916
B12	.08737	.43724
B25	.36505	.43358
B20	.19018	.36444
B8	- .02365	.34116
B1	- .25507	.32829
B18	.26333	.29894

Table A-11

Measure: Work Preferences Questionnaire (N = 634)

Form A: "Preferred Work/Task Characteristics" (20 items)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
A1	.17901	1	4.50931	22.5	22.5
A2	.18059	2	1.32722	6.6	29.2
A4	.52398				
A5	.21994				
A6	.32641				
A7	.37334				
A9	.15746				
A12	.16845				
A13	.26040				
A14	.25928				
A15	.42984				
A16	.46437				
A17	.25932				
A18	.13760				
A20	.15631				
A22	.18109				
A23	.32516				
A24	.50178				
A25	.31782				
A26	.41440				

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
A4	.72046	- .07011
A24	.69597	- .13191
A16	.67081	.11994
A15	.65425	.04237
A26	.62130	.16848
A7	.60605	- .07776
A13	.50833	.04466
A5	.46411	.06741
A23	.46403	.31142
A17	.45771	.22320
A22	.42508	.01990
A2	.41356	.09775
A9	.37398	.13267
A18	.26733	.25716
A6	.02259	.57088
A14	- .23960	.44930
A25	.36609	.42871
A12	.09510	.39925
A20	.19091	.34621
A1	- .25638	.33658

Table A-12

Measure: Work Preferences Questionnaire (N = 634)

Form B: "Actual Work/Task Characteristics" (20 items)

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum. %
B1	.17259	1	4.36658	21.8	21.8
B2	.18698	2	1.39041	7.0	28.8
B4	.54184				
B5	.22519				
B5	.27875				
B7	.39554				
B8	.13140				
B9	.17513				
B12	.18748				
B13	.23470				
B14	.27058				
B15	.44052				
B16	.46261				
B17	.25010				
B18	.15803				
B21	.11940				
B23	.31082				
B24	.48722				
B25	.31537				
B26	.41650				

Rotated Factor Matrix:

Variable	Factor 1	Factor 2
B4	.72104	- .14813
B16	.67849	.04754
B24	.67008	- .19548
B15	.66253	- .03978
B26	.59548	.10150
B7	.59548	- .20235
B13	.48435	.01052
B23	.47787	.28716
B17	.47605	.15321
B15	.47322	.03524
B12	.42961	.04916
B25	.41820	.37480
B9	.40436	.10779
B18	.29741	.26378
B21	.28459	.19599
B6	.08921	.52037
B14	- .19377	.48274
B12	.14010	.40970
B8	.02138	.36186
B1	- .21523	.35535

Key to items in Work Preferences Questionnaire: ("Preferred Work/Task Characteristics)

A1 Work Variety
A2 Opportunities to meet people
A3 Financial reward, good salary
A4 Responsibility for other people
A5 Job Security
A6 Responsibility for things
A7 Predictable work routine
A8 Opportunities to help others
A9 Opportunities for achievement
A10 Friendly, congenial work colleagues
A11 Seeing tangible results
A12 Status, respect from others
A13 Challenging work
A14 A familiar, undemanding routine
A15 Opportunities to work in a group
A16 Regular work hours
A17 Opportunities for promotion
A18 Interesting, absorbing work
A19 Socially useful work
A20 Opportunities to work independently
A21 Clean, pleasant work environment
A22 Work that is finished at the end of each day
A23 Physically active work
A24 Opportunities to talk socially with others
A25 Straight forward and clearly defined work
A26 Being of service to others

Key to items in Work Preferences Questionnaire: ("Actual" Work/Task Characteristics)

B1 A familiar, undemanding routine
B2 Opportunities for promotion
B3 Opportunities to work in a group
B4 Interesting, absorbing work
B5 Socially useful work
B6 Straight forward and clearly defined work
B7 Variety of work
B8 Regular work hours
B9 Opportunities to meet people
B10 Physically active work
B11 Opportunities to work independently
B12 Work that is finished at the end of each day
B13 Responsibility for others people
B14 Predictable work routine
B15 Opportunities for achievement
B16 Opportunities to help other
B17 Seeing tangible results
B18 Friendly, congenial work colleagues
B19 Financial reward, good salary
B20 Job security
B21 Opportunities to talk socially with others
B22 Responsibility for things
B23 Status, respect from othersB24Challenging work
B25 Clean, pleasant work environment
B26 Being of service to others

Appendix II

Study 1 Questionnaire

WORK & WELL-BEING SURVEY

PART A

This part of the questionnaire is concerned with background information relating to your work, health and personal matters. Please try to answer all the questions. If two or more possible answers are given, please tick the answer appropriate to you.

Date: _____

Personal Details

1. Age _____ Sex _____ Present marital status _____

   Number of children _____ Ages of children if under 18 _____

   County of residence _____

2. Formal educational qualifications: (Please tick as appropriate)

   None _____ "O" levels _____ "A" levels of equivalent _____

   Degree level and above _____

   Other qualifications: (Please specify)

   _____

   _____

Occupation

3.1 Are you self-employed? Yes _____ No _____

(If No, go on to Question 3.2)

If Yes, do you employ other people?

No _____

Yes _____ (How many people do you employ? _____

What type of business do you operate? _____

_____

3.2 (Please answer the questions whether self-employed or otherwise)

Present occupation _____

Job level/Position _____

Are you responsible for the work of others? Yes _____ No _____

If Yes, how many others? _____

What type of business does your company do? _____

_____

_____

(e.g. manufacturing, engineering, medical, retailing etc.)

What is the approximate number of staff in the company where you work? ____

Please briefly describe the work you do: _____

_____

_____

3.3 Do you work: Part-time? _____ Full-time? _____

How many hours, approximately, do you work a week? _____

How many years have you been in your present employment? _____

Please indicate your previous job immediately before this one: _____

_____

How many years did you work at this (previous job)? _____

Health and Recreation

4. What is your height? _____ (without shoes).

What is your weight? _____ (office clothes, no shoes or heavy clothing).

Overall, how would you rate your health in the PAST SIX MONTHS?

Poor _____ Fair _____ Average _____ Good _____ Excellent _____ (tick one)

Do you smoke? Yes _____ No _____

If yes, how many cigarettes per day do you smoke? _____

(or pipes per day? _____)

5. What are your main hobbies/sports?

_____

_____

_____

How frequently, in the last six months, on average, do you participate in active sports, physical exercise?

At least 6 days a week _____ 3 - 5 days/week _____

1 -2 days a week _____ Less than once/week _____

Never, rarely _____

PART B

This part of the questionnaire is concerned with you and the work environment and asks about your attitudes, interests and views. There are no correct or incorrect answers, and no trick questions. We are just interested in how people differ. Please answer to each question, but don't spend too much time thinking about the exact meaning of any one item - your immediate response is usually the most appropriate.

For each set of items in this part of the questionnaire there are separate instructions - please read them before you begin.

INSTRUCTIONS

A number of general statements about work are listed below. Please use the rating scales to indicate the extent to which you expect the statements to be true of *your overall work situation*.

For instance, if you think the first statement applies "very much indeed" to your work, circle the number 4 against the statement; if you think that it applies "not at all", circle number; and circle 2 or 3 if some intermediate score is appropriate. Please respond to each statement in the list.

		Not At All			Very Much Indeed
1.	Have to work very hard	1	2	3	4
2.	Allows opportunities to meet people	1	2	3	4
3.	Repetitive	1	2	3	4
4.	No time to finish tasks	1	2	3	4
5.	Allows you o make your own decisions	1	2	3	4
6.	Creative	1	2	3	4
7.	Lots of work	1	2	3	4
8.	Allows freedom	1	2	3	4
9.	Allows you to participate in decision making	1	2	3	4
10.	Work gives rise to conflicting demands	1	2	3	4
11.	Have to work fast	1	2	3	4
12.	Work requires a high degree of skill	1	2	3	4
13.	Not enough time to do the work	1	2	3	4
14.	Allows you to have a say on the job	1	2	3	4
15.	Excessive amount of work	1	2	3	4

INSTRUCTIONS

For each of these three questions, please look at the descriptions at either end of the scale, and answer by circling a number between 1 and 5.

1. At times, everyone feels fed up with his/her job. How often do you feel fed-up with your present job?

1	2	3	4	5
Very Rarely				Very frequently

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

1	2	3	4	5
Very Rarely				Very frequently

3. How much have you enjoyed your work over the past 6 weeks?

1	2	3	4	5
Very Rarely				Very frequently

If you were to run into difficulties at work, how helpful do you think the following people would be?

	Not At All	A Little	Some-what	Very Much	Not Applicable
A. Your immediate supervisor/boss	0	1	2	3	N.A.
B. Other work colleagues	0	1	2	3	N.A.
C. Your spouse/partner	0	1	2	3	N.A.
D. Your friends and relatives	0	1	2	3	N.A.
E. Others (If applicable, please specify)					
_____	0	1	2	3	N.A.

(If you do not have a supervisor, work colleagues, or spouse/partner, please circle the appropriate column headed "N.A.")

These two general questions cover the work environment. The questions an be interpreted very broadly but if nothing occurs to you, just omit them.

1. What are the most important sources of work satisfaction to you in your present job?

2. What are the most important sources of work-related stress you are likely to experience in your present job?

INSTRUCTIONS

In each of the following questions, please put a circle around the "YES" or the "NO" to indicate the answer that is true, or most usually true, of yourself.

1.	Does your mood go up and down?	YES	NO
2.	Are you talkative person?	YES	NO
3.	Do you ever feel "just miserable" for no reason?	YES	NO
4.	Are you rather lively?	YES	NO
5.	Are you an irritable person?	YES	NO
6.	Do you enjoy meeting new people?	YES	NO
7.	Are your feelings easily hurt?	YES	NO
8.	Can you usually let yourself go and enjoy yourself?	YES	NO
9.	Do you often feel "fed up"	YES	NO
10.	Do you usually take the initiative in making new friends?	YES	NO
11.	Would you call yourself a nervous person?	YES	NO
12.	Can you easily get some life into a rather dull party?	YES	NO
13.	Are you a worrier?	YES	NO
14.	Do you tend to keep in the background on social occasions?	YES	NO
15.	Would you call yourself tense or "highly strung"	YES	NO
16.	Do you like mixing with people?	YES	NO
17.	Do you worry too long after an embarrassing experience	YES	NO
18.	Do you like plenty of bustle and excitement around you?	YES	NO
19.	Do you suffer from nerves?	YES	NO
20.	Are you mostly quiet when you are with other people?	YES	NO
21.	Do you often feel lonely?	YES	NO
22.	Do other people think of you as being very lively?	YES	NO
23.	Are you often troubled about feelings of guilt?	YES	NO
24.	Can you get a party going?	YES	NO

INSTRUCTIONS

Each of the items listed below is followed by five alternative responses. Please circle the response which you think is most true of yourself.

1. If a job is worth doing, it is worth doing well. How many activities in your life come into this category?

   Very few / few / some / many / most

2. Experience of failure makes one try harder. How often is this true of you?

   Hardly ever / seldom / about half the time / frequently / nearly always

3. My efforts are directed towards avoiding failure rather than achieving success.

   Nearly always / frequently / about half the time / seldom / hardly ever

4. I am hesitant to undertake any venture that might result in failure.

   Hardly ever / seldom / about half the time / frequently / nearly always

5. I seek opportunities to excel.

   Nearly always / frequently / about half the time / seldom / hardly ever

6. I lack self-confidence when I have to compete against others.

   Nearly always / frequently / about half the time / seldom / hardly ever

7. In how many activities are you personally concerned about your standard of performance?

   Very few / few / some / many / most

8. I avoid situations in which I might expose myself to evaluation.

   Hardly ever / seldom / about half the time / frequently / nearly always

9. I just expect to fail things.

   Hardly ever / seldom / about half the time / frequently / nearly always

10. How much effort do you use to reach the goals you set yourself?

    100% / 75% / 50% / 25% / almost 0%

INSTRUCTIONS

Please indicate the extent to which you agree or disagree with each of the statements below as it applies to you, taking a score of 1 as "strongly disagree"; a score of 4 as having "no view either way"; and 7 as "strongly agree". You may of course use intermediate scores as appropriate.

(N.B. Some of these items are negatively worded, so please take extra care that you endorse the "agree" or "disagree" end of the scale appropriately.)

		Strongly Disagree						Strongly Agree
1.	When I get what I want it's usually because I worked hard for it.	1	2	3	4	5	6	7
2.	In attempting to smooth over a disagreement I usually make it worse.	1	2	3	4	5	6	7
3.	I usually don't set goals because I have a hard time following through on them.	1	2	3	4	5	6	7
4.	I have no trouble making and keeping friends.	1	2	3	4	5	6	7
5.	When I make plans I am almost certain to make them work.	1	2	3	4	5	6	7
6.	I prefer games involving some luck over games requiring pure skill.	1	2	3	4	5	6	7
7.	When being interviewed, I can usually steer the interviewer toward the topics I want to talk about and away from those I wish to avoid.	1	2	3	4	5	6	7
8.	I can learn almost anything if I set my mind to it.	1	2	3	4	5	6	7
9.	Competition discourages excellence.	1	2	3	4	5	6	7
10.	I often find it hard to get my point of view across to others.	1	2	3	4	5	6	7

	Strongly Disagree						Strongly Agree
11. Often people get ahead by being lucky.	1	2	3	4	5	6	7
12. It's pointless to keep working on something that's too difficult for me.	1	2	3	4	5	6	7
13. My major accomplishments are entirely due to my hard work and ability	1	2	3	4	5	6	7
14. I'm not as good at guiding the course of a conversation with several others.	1	2	3	4	5	6	7
15. I can usually establish a close personal relationship with someone I find attractive.	1	2	3	4	5	6	7
16. If I need any help in carrying off a plan of mine, its's usually difficult to get others to help.	1	2	3	4	5	6	7
17. I find it easy to play an important part in most group situations.	1	2	3	4	5	6	7
18. Even when I'm feeling self-confident about most things, I still seem to lack the ability to control social situations.	1	2	3	4	5	6	7
19. On any sort of exam or competition, I like to know how well I do relative to everyone else.	1	2	3	4	5	6	7
20. If there's someone I want to meet, I can usually arrange it.	1	2	3	4	5	6	7

INSTRUCTIONS

This scale is made up of a list of statements each of which may or may not be true about you. For each statement, we would like you to circle **probably TRUE (T)** if the statement is true about you, or **probably FALSE (F)** if the statement is not true about you.

You may find that many of the statements are neither clearly true nor clearly false. In these cases, try to decide **quickly** whether probably TRUE (T) or probably FALSE (F) is most descriptive of you. Although some questions will be difficult to answer, it is important that you pick one alternative or the other. Remember to circle only one of the alternatives for each statement.

Please read each item quickly but carefully before responding. Remember that this is not a test and there are no right or wrong answers.

1.	There is at least one person I know whose advice I really trust.	T	F
2.	If I decide on a Friday afternoon that I would like to go to a film that evening, I could find someone to go with me.	T	F
3.	If I were sick and needed someone to drive me to the doctor, I would have trouble finding someone.	T	F
4.	There is someone who I do feel comfortable going to for advice about personal problems.	T	F
5.	There are several different people with whom I enjoy spending time with.	T	F
6.	If I needed some help in moving to a new home, I would have a hard time finding someone to help me.	T	F
7.	There is someone I can turn to for advice about handling problems concerning household responsibilities.	T	F
8.	No one I know would throw a party for me (e.g. to celebrate a birthday or some special occasion).	T	F
9.	If for some reason I was remanded on bail there is someone I know who would put up the money for me.	T	F
10.	When I need suggestions for how to deal with a personal problem, I know there is someone I can turn to.	T	F
11.	If I wanted to lunch with someone, I could easily find someone to join me.	T	F
12.	If I were sick, there would be almost no one I could find to help me with my daily chore.	T	F

13.	There is someone I could turn to for advice about changing my job or finding a new one.	T	F
14.	I don't often get invited to do things with others.	T	F
15.	If I had to go out of town for a few weeks, someone I know would look after my home (the plant, pets, gardens, etc.)	T	F
16.	I feel that there is no one with whom I can share my most private worries and fears.	T	F
17.	When I feel lonely, there are several people I could call and talk to.	T	F
18.	If I got stranded 10 miles out of town, there is someone I could call to come and get me.	T	F
19.	There is really no one who can give me objective feedback about how I'm handling my problems.	T	F
20.	I feel that I'm on the fringe in my circle of friends.	T	F
21.	If I had to mail an important letter at the post office by 5.00 and couldn't make it, there is someone who could do it for me.	T	F
22.	If a family crisis arose few of my friends would be able to give me good advice about handling it.	T	F
23.	I regularly meet or talk with members of my family or friends.	T	F
24.	There is no one I could call on if I needed to borrow a car for a few hours.	T	F
25.	There are very few people I could trust to help solve my problems.	T	F
26.	If I wanted to go out for the day it would be difficult to find someone to go with me.	T	F
27.	If I needed a quick emergency loan of £100, there is someone I could get it from.	T	F
28.	If I needed a lift to the airport very early in the morning, it would be difficult finding someone to go with me.	T	F
29.	Most people I know don't enjoy the same things that I do.	T	F
30.	There is really no one I can trust to give me good financial advice.	T	F

INSTRUCTIONS

We should like to know if you have had any medical complaints, and how your health has been in general, **OVER THE PAST SIX WEEKS.** Please answer ALL the questions on the following pages simply by underlining the answer you think most early applies to you. Remember that we want to know about your present and recent complaints, not those that you had in the past.

HAVE YOU RECENTLY:-

1.	been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2.	lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3.	felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
4.	felt capable of making decisions about things?	More so than usual	Same as usual	LEss so than usual	Much less capable
5.	felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6.	felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7.	been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8.	been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
9.	been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10.	been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11.	been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12.	been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual

INSTRUCTIONS

The events shown below require individuals to change and adapt to new circumstances. It would be useful for us to know which of these events have happened to you DURING THE PAST YEAR. Please place a tick against the relevant events.

Change to different type of work _____
Spouse/partner begins or stops work _____
Personal injury or illness _____
Major change in eating haBits _____
Marriage _____
Illness of family member _____
Change in recreation activities _____
Death of spouse/partner _____
Marital reconciliation _____
Change in financial status _____
Death of a close friend _____
Change in responsibilities at work _____
Son or daughter leaving home _____
Trouble with in-laws _____
Outstanding personal achievement _____
Change in living conditions _____
A new baby in the family _____
Change in work hours or conditions _____
Increase in number of arguments with spouse _____
Change in place of residence _____
Promotion at work _____
Change in church activities _____
Divorce _____
Trouble with superiors at work _____
Change in social activities _____
Change in number of family get-togethers _____
Marital separation _____
Holiday away from home _____
Death of close family member _____

NONE OF THE ABOVE _____

If you have any further comments about your work or this questionnaire which you think may be useful to this research, please note them below:

FINALLY, please check that you have answered all the questions.

THANK YOU VERY MUCH FOR YOUR CO-OPERATION

Appendix III

Study 2 Questionnaires

Study 2 Questionnaire

1st Assessment

PART A

This part of the questionnaire is concerned with background information relating to your work, health, recreational interests and other general matters. Please try to answer all the questions. If two or more possible answers are given, please tick the answer appropriate to you. Please check that the research number in this questionnaire corresponds with the number shown on the research slip. If it is incorrect please note this on the page overleaf.

Research Number: _____ Date: _____

1. **Personal Details**

(a) Age _____Sex _____Present Marital Status _____

(b) University Qualifications: (Please tick as appropriate)

Subject area of degree _____

Class of degree: 1st _____ 2.1 _____ 3 _____

Other (Please specify) _____

2. **Occupation**

(a) Occupation (e.g. engineer, management trainee, accountant, post-graduate study, researcher):

_____

Type of organization/firm: (Please tick one)

Retail _____ Banking/Finance _____ Accountancy _____ Legal _____

Local Govt. _____ Civil Service _____ Industry _____ Education _____

Other (Please specify) _____

(b) How many people are employed in the department which you work? _____

Please briefly describe the work you do:

_____

_____

_____

_____

(c) When did you start your present job? Day _____ Month _____ Year _____

Did you have a full-time job before starting undergraduate studies at Oxford?

Yes _____ No _____

If Yes, please indicate your previous job and how long you worked:

_____

_____

(d) How many hours, on average, do you work in a week? _____

In the last month, how many hours of what you consider overtime, did you do?_____

How many of these overtime hours did you actually want to work? _____

3. Health & Recreation

(a) What is your height? _____ (without shoes.)

What is your weight? _____ (office clothes, no shoes/heavy clothing.)

(b) Overall, how would you rate your health in the PAST SIX MONTHS?

Poor _____ Fair _____ Average _____ Good _____ Excellent _____ (tick one)

(c) Do you smoke? Yes _____ No _____

If yes, how many cigarettes per day do you smoke? _____

(d) During your years at Oxford, how frequently did you participate in sports or physical exercise?

5-7 days/week _____ 3-4 days/week _____ 1-2 days/week _____

Less than once/week _____ Never/rarely _____

(e) Since starting work, how often do you participate in sports or physical exercise?

5-7 days/week _____ 3-4 days/week _____ 1-2 days/week _____

Less than once/week _____ Never/rarely _____

PART B

This part of the questionnaire is concerned with you and the work environment and asks about your attitudes, interests and views. There are no correct or incorrect answers, and no trick questions. We are just interested in how people differ. Please answer to each question, but don't spend too much time thinking about the exact meaning of any one item - your immediate response is usually the most appropriate.

For each set of items in this part of the questionnaire there are separate instructions - please read them before you begin.

WHAT DO YOU LOOK FOR IN A JOB?

People work for many different reasons. We have listed below some of the things people look for in a job. Please indicate by circling the appropriate number on each scale the extent to which each of these reasons is important to you (regardless of whether or not it applies to your present job).

		Not At All				Very Much Indeed
1.	Opportunities for meeting people	1	2	3	4	5
2.	Responsibility for other people	1	2	3	4	5
3.	Predictable work routine	2	2	3	4	5
4,	Opportunities to help other people	1	2	3	4	5
5.	Opportunities for achievement	1	2	3	4	5
6.	Friendly, congenial work colleagues	1	2	3	4	5
7.	Seeing tangible results	1	2	3	4	5
8.	Challenging work	1	2	3	4	5
9.	A familiar, undemanding routine	1	2	3	4	5
10.	Regular work hours	1	2	3	4	5
11.	Interesting, absorbing work	1	2	3	4	5
12.	Clean, pleasant work environment	1	2	3	4	5
13.	Work that is finished at the end of each day	1	2	3	4	5
14.	Straight-forward & clearly defined work	1	2	3	4	5
15.	Being of service to others	1	2	3	4	5

INSTRUCTIONS

A number of general statements about work are listed below. Please use the rating scales to indicate the extent to which you expect the statements apply to *your present work situation*.

For instance, if you think the first statement applies "very much indeed" to your work, circle the number 4 against the statement; if you think that it applies "not at all", circle number; and circle 2 or 3 if some intermediate score is appropriate. Please respond to each statement in the list.

		Not At All			Very Much Indeed
1.	Have to work very hard	1	2	3	4
2.	Allows opportunities to meet people	1	2	3	4
3.	Repetitive	1	2	3	4
4.	No time to finish tasks	1	2	3	4
5.	Allows you o make your own decisions	1	2	3	4
6.	Creative	1	2	3	4
7.	Lots of work	1	2	3	4
8.	Allows freedom	1	2	3	4
9.	Allows you to participate in decision making	1	2	3	4
10.	Work gives rise to conflicting demands	1	2	3	4
11.	Have to work fast	1	2	3	4
12.	Work requires a high degree of skill	1	2	3	4
13.	Not enough time to do the work	1	2	3	4
14.	Allows you to have a say on the job	1	2	3	4
15.	Excessive amount of work	1	2	3	4

INSTRUCTIONS

For each of these three questions, please look at the descriptions at either end of the scale, and answer by circling a number between 1 and 5.

1. At times, everyone feels fed up with his/her job. How often do you feel fed-up with your present job?

1	2	3	4	5
Very Rarely				Very frequently

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

1	2	3	4	5
Very Rarely				Very frequently

3. How much have you enjoyed your work over the past 6 weeks?

1	2	3	4	5
Very Rarely				Very frequently

INSTRUCTIONS

The following questions ask about your work environment and the people who are helpful to you. Please circle the response that best describes how you feel. *(If you do not have a supervisor or wife/husband/spouse, please circle the appropriate column headed "NA".)*

1. How much can each of these people be relied on when things go wrong <u>at work</u> and you need someone to talk to?

	Not At All	A Little	Some-what	Very Much	A Great Deal	
Your immediate supervisor/boss	1	2	3	4	5	NA
Other people at work	1	2	3	4	5	
Your wife/husband/partner	1	2	3	4	5	NA
Your friends and relatives	1	2	3	4	5	

2. To what extent are the following people willing to listen to your <u>work-related problems</u>?

	Not At All	A Little	Some-what	Very Much	A Great Deal	
Your immediate supervisor/boss	1	2	3	4	5	NA
Other people at work	1	2	3	4	5	
Your wife/husband/partner	1	2	3	4	5	NA
Your friends and relatives	1	2	3	4	5	

3. How much does each of the following people go out of their way to do things to make your <u>work life easier</u> for you?

	Not At All	A Little	Some-what	Very Much	A Great Deal	
Your immediate supervisor/boss	1	2	3	4	5	NA
Other people at work	1	2	3	4	5	
Your wife/husband/partner	1	2	3	4	5	NA
Your friends and relatives	1	2	3	4	5	

4. To what extent are the following statements TRUE of your senior work colleagues(s) to whom you are responsible to?

	Not At All	A Little	Some-what	Very Much	A Great Deal
Senior staff are very concerned with the welfare of those under them	1	2	3	4	5
Senior staff go out of their way to praise, encourage good work	1	2	3	4	5

INSTRUCTIONS

In each of the following questions, please put a circle around the "YES" or the "NO" to indicate the answer that is true, or most usually true, of yourself.

1.	Does your mood go up and down?	YES	NO
2.	Are you talkative person?	YES	NO
3.	Do you ever feel "just miserable" for no reason?	YES	NO
4.	Are you rather lively?	YES	NO
5.	Are you an irritable person?	YES	NO
6.	Do you enjoy meeting new people?	YES	NO
7.	Are your feelings easily hurt?	YES	NO
8.	Can you usually let yourself go and enjoy yourself?	YES	NO
9.	Do you often feel "fed up"	YES	NO
10.	Do you usually take the initiative in making new friends?	YES	NO
11.	Would you call yourself a nervous person?	YES	NO
12.	Can you easily get some life into a rather dull party?	YES	NO
13.	Are you a worrier?	YES	NO
14.	Do you tend to keep in the background on social occasions?	YES	NO
15.	Would you call yourself tense or "highly strung"	YES	NO
16.	Do you like mixing with people?	YES	NO
17.	Do you worry too long after an embarrassing experience	YES	NO
18.	Do you like plenty of bustle and excitement around you?	YES	NO
19.	Do you suffer from nerves?	YES	NO
20.	Are you mostly quiet when you are with other people?	YES	NO
21.	Do you often feel lonely?	YES	NO
22.	Do other people think of you as being very lively?	YES	NO
23.	Are you often troubled about feelings of guilt?	YES	NO
24.	Can you get a party going?	YES	NO

What are the most important sources of work satisfaction to you in your present job?

INSTRUCTIONS

Please indicate the extent to which you agree or disagree with each of the statements below as it applies to you, taking a score of 1 as "strongly disagree"; a score of 4 as having "no view either way"; and 7 as "strongly agree". You may of course use intermediate scores as appropriate.

(N.B. Some of these items are negatively worded, so please take extra care that you endorse the "agree" or "disagree" end of the scale appropriately.)

		Strongly Disagree						Strongly Agree
1.	When I get what I want it's usually because I worked hard for it.	1	2	3	4	5	6	7
2.	In attempting to smooth over a disagreement I usually make it worse.	1	2	3	4	5	6	7
3.	I usually don't set goals because I have a hard time following through on them.	1	2	3	4	5	6	7
4.	I have no trouble making and keeping friends.	1	2	3	4	5	6	7
5.	When I make plans I am almost certain to make them work.	1	2	3	4	5	6	7
6.	I prefer games involving some luck over games requiring pure skill.	1	2	3	4	5	6	7
7.	When being interviewed, I can usually steer the interviewer toward the topics I want to talk about and away from those I wish to avoid.	1	2	3	4	5	6	7
8.	I can learn almost anything if I set my mind to it.	1	2	3	4	5	6	7
9.	Competition discourages excellence.	1	2	3	4	5	6	7
10.	I often find it hard to get my point of view across to others.	1	2	3	4	5	6	7

	Strongly Disagree						Strongly Agree
11. Often people get ahead by being lucky.	1	2	3	4	5	6	7
12. It's pointless to keep working on something that's too difficult for me.	1	2	3	4	5	6	7
13. My major accomplishments are entirely due to my hard work and ability	1	2	3	4	5	6	7
14. I'm not as good at guiding the course of a conversation with several others.	1	2	3	4	5	6	7
15. I can usually establish a close personal relationship with someone I find attractive.	1	2	3	4	5	6	7
16. If I need any help in carrying off a plan of mine, its's usually difficult to get others to help.	1	2	3	4	5	6	7
17. I find it easy to play an important part in most group situations.	1	2	3	4	5	6	7
18. Even when I'm feeling self-confident about most things, I still seem to lack the ability to control social situations.	1	2	3	4	5	6	7
19. On any sort of exam or competition, I like to know how well I do relative to everyone else.	1	2	3	4	5	6	7
20. If there's someone I want to meet, I can usually arrange it.	1	2	3	4	5	6	7

INSTRUCTIONS

We should like to know if you have had any medical complaints, and how your health has been in general, **OVER THE PAST SIX WEEKS**. Please answer ALL the questions on the following pages simply by underlining the answer you think most early applies to you. Remember that we want to know about your present and recent complaints, not those that you had in the past.

HAVE YOU RECENTLY:-

1.	been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2.	lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3.	felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
4.	felt capable of making decisions about things?	More so than usual	Same as usual	LEss so than usual	Much less capable
5.	felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6.	felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7.	been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8.	been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
9.	been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10.	been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11.	been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12.	been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual
13.	been managing to keep yourself busy and occupied?t	More so than usual	Same as usual	Rather less than usual	Much less than usual
14.	been taking longer over the things you do?	Quicker than usual	Same as usual	Longer than usual	Much longer than usual
15.	felt on the whole you were doing things well?	Better than usual	About the same	Less well than usual	Much less well
16.	been satisfied with the way you've carried out your task?	More satisfied	About same as usual	Less satisfied than usual	Much less satisfied

Finally, if you wish to expand on your answers to any of the questions in this section, or to make general comments on these topics, please use the space below continuing overleaf if necessary.

THANK YOU

Study 2 Questionnaire

2nd Assessment

Research Number: _____ **Date:** _____

PART A

This part of the questionnaire is concerned with background information relating to your work, health, recreational interests and other general matters. Please try to answer all the questions. If two or more possible answers are given, please tick the answer appropriate to you. Please check that the research number in this questionnaire corresponds with the number shown on the research slip. If it is incorrect please note this on the page overleaf.

INSTRUCTIONS

A number of general statements about work situations which have been used in studying different occupations are listed below. Please use the rating scales to indicate the extent to which these statements are true of your present work situation.

For instance, if you think the first statement applies "very much indeed" to your work, circle the number 4 against the statement; if you think that it applies "not at all", circle number; and circle 2 or 3 if some intermediate score is appropriate. Please respond to each statement in the list.

		Not At All			Very Much Indeed
1.	Have to work very hard	1	2	3	4
2.	Allows opportunities to meet people	1	2	3	4
3.	Repetitive	1	2	3	4
4.	No time to finish tasks	1	2	3	4
5.	Allows you o make your own decisions	1	2	3	4
6.	Creative	1	2	3	4
7.	Lots of work	1	2	3	4
8.	Allows freedom	1	2	3	4
9.	Allows you to participate in decision making	1	2	3	4
10.	Work gives rise to conflicting demands	1	2	3	4
11.	Have to work fast	1	2	3	4
12.	Work requires a high degree of skill	1	2	3	4
13.	Not enough time to do the work	1	2	3	4
14.	Allows you to have a say on the job	1	2	3	4
15.	Excessive amount of work	1	2	3	4

Work Environment

1. Have you changed your job or moved to another company/organization in the last six months?

   Yes _____ No _____

   If Yes, could you please give details of your present occupation, the organization you work for, and the date you joined them.

2. In the last six months, have you experienced any major changes in your work pattern or work environment? (e.g. transfer to another department, relocation to another branch in a different part of the country etc.)

   If Yes, please specify: (continue on the next page if you wish)

   When did this take place? (Please give the date.)

   Date _____

3. Career Plan:

   Do you anticipate that you will remain in your present job for:
   (Please tick one)

   Less than 6 months _____ At least 6 months _____ 7 - 12 months _____

   1 - 2 years _____ More than 2 years _____

   If you have any further comments on your future career plans please note them below and continue overleaf if necessary.

4. (a) Do you use a VDU at work? Yes _____ No _____

If No, please go on to Question 4(f).

If Yes,

How many hours a day do you use the VDU? _____

How does this vary from day to day over a period of say, a week?

Does not vary at all _____ Varies slightly _____

Varies moderately _____ Varies a great deal _____

(b) Is the VDU situated at the same desk where you work?

Yes _____ No _____

If No, please specify _____

_____

_____

_____

(c) What tasks do you use the VDU for? (e.g. word processing, accounts, programming)

_____

_____

(e) How long have you been using the VDU facility in your present job?

_____ years _____ months

(f) If you have any further comments about the workplace or physical health problems related to work please note them below.

WAYS OF COPING

People deal with job tensions or anxiety in different ways. When you experience heavy workload, or other forms of work stress, how likely are you to respond in the following ways? Please circle a number between 1 and 5 on the scale below to indicate your response.

	Hardly ever do this				Almost always do this
1. Try to be very organized so that I can keep on top of things.	1	2	3	4	5
2. Try to see this situation as an opportunity to lean and develop new skills.	1	2	3	4	5
3. Do my best to get out of the situation gracefully.	1	2	3	4	5
4. Pay extra attention to planning and scheduling.	1	2	3	4	5
5. Try to think of myself as a winner - as someone who always comes through.	1	2	3	4	5
6 Separate myself as much as possible from the people who created this situation.	1	2	3	4	5
7. Tell myself that I can probably work things out to my advantage.	1	2	3	4	5
8. Devote more time and energy to doing my job.	1	2	3	4	5
9. Anticipate the negative consequences so that I'm prepared for the worse.	1	2	3	4	5
10. Avoid being in this situation if I can.	1	2	3	4	5
11. Try to get additional people involved in the situation.	1	2	3	4	5
12. Think about the challenges I can find in this situation.	1	2	3	4	5
13. Remind myself that work isn't everything.	1	2	3	4	5
14. Try to work harder and more efficiently.	1	2	3	4	5
15. Decide what I think should be done and explain this to the people who are affected.	1	2	3	4	5
16. Give my best effort to do what I think is expected of me.	1	2	3	4	5
17. Work on changing policies which caused this situation.	1	2	3	4	5
18. Tell myself that time takes care of situations like this.	1	2	3	4	5

Please note below any other ways of coping with work-related demands that you regularly use.

HOW WOULD YOU DESCRIBE YOUR PRESENT JOB?

For each of the following items please indicate by circling the appropriate number on the scale the extent to which the item describes your present work.

		Not At All				To a Very High Degree
1.	Opportunities to meet people	1	2	3	4	5
2.	Responsibility for other people	1	2	3	4	5
3.	A predictable work routine	2	2	3	4	5
4,	Opportunities to help other people	1	2	3	4	5
5.	Opportunities for achievement	1	2	3	4	5
6.	Friendly, congenial work colleagues	1	2	3	4	5
7.	Provides tangible results	1	2	3	4	5
8.	Challenging work	1	2	3	4	5
9.	A familiar, undemanding routine	1	2	3	4	5
10.	Regular work hours	1	2	3	4	5
11.	Interesting, absorbing work	1	2	3	4	5
12.	A clean, pleasant working environment	1	2	3	4	5
13.	Work that is finished at the end of each day	1	2	3	4	5
14.	Straight-forward & clearly defined work	1	2	3	4	5
15.	Opportunities for service to others	1	2	3	4	5

INSTRUCTIONS

The following questions ask about your work environment and the people who are helpful to you. Please circle the response that best describes how you feel. *(If you do not have a supervisor or wife/husband/spouse, please circle the appropriate column headed "NA".)*

1. How much can each of these people be relied on when things go wrong at work and you need someone to talk to?

	Not At All	A Little	Some-what	Very Much	A Great Deal	
Your immediate supervisor/boss	1	2	3	4	5	NA
Other people at work	1	2	3	4	5	
Your wife/husband/partner	1	2	3	4	5	NA
Your friends and relatives	1	2	3	4	5	

2. To what extent are the following people willing to listen to your work-related problems?

	Not At All	A Little	Some-what	Very Much	A Great Deal	
Your immediate supervisor/boss	1	2	3	4	5	NA
Other people at work	1	2	3	4	5	
Your wife/husband/partner	1	2	3	4	5	NA
Your friends and relatives	1	2	3	4	5	

3. How much does each of the following people go out of their way to do things to make your work life easier for you?

	Not At All	A Little	Some-what	Very Much	A Great Deal	
Your immediate supervisor/boss	1	2	3	4	5	NA
Other people at work	1	2	3	4	5	
Your wife/husband/partner	1	2	3	4	5	NA
Your friends and relatives	1	2	3	4	5	

4. To what extent are the following statements TRUE of your senior work colleagues(s) to whom you are responsible to?

	Not At All	A Little	Some-what	Very Much	A Great Deal
Senior staff are very concerned with the welfare of those under them	1	2	3	4	5
Senior staff go out of their way to praise, encourage good work	1	2	3	4	5

INSTRUCTIONS

For each of these three questions, please look at the descriptions at either end of the scale, and answer by circling a number between 1 and 5.

1. At times, everyone feels fed up with his/her job. How often do you feel fed-up with your present job?

1	2	3	4	5
Very Rarely				Very frequently

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

1	2	3	4	5
Very Rarely				Very frequently

3. How much have you enjoyed your work over the past 6 weeks?

1	2	3	4	5
Very Rarely				Very frequently

4. How would you rate your overall level of workload?

1	2	3	4	5
Very Low				Very High

3. Overall, how much have autonomy do you have in your job? (i.e., control over the work you do, and how you do it.)

1	2	3	4	5
Very Little				Very Much

PART B

Health & Work

1. (a) How many hours, on average, do you work a week?

_____

(b) In the last month, how many hours of what you consider overtime, did you do?

_____

How many of these overtime hours did you actually want to work, either for money or to get something done?

_____

2. (a) In the past six months, have you been away from work for any period of less than a week? (e.g. because of minor illness or as a result of just feeling unwell.)

Yes _____ No _____

If Yes, on how many occasions have you been away from work? _____

About how many days in total? _____

(b) Do you smoke? Yes _____ No _____

If yes, how many cigarettes per day do you smoke? _____

(c) Overall, how would you rate your health in the PAST SIX MONTHS?

Poor _____ Fair _____ Average _____ Good _____ Excellent _____ (tick one)

(d) Over the past six months how frequently have you participated in active sports or physical exercise?

5-7 days/week _____ 3-4 days/week _____ 1-2 days/week _____

Less than once/week _____ Never, rarely _____

(e) How would you rate your health in the PAST SIX MONTHS?

Poor _____ Fair _____ Average _____ Good _____ Excellent _____ (tick one)

INSTRUCTIONS

We should like to know if you have had any medical complaints, and how your health has been in general, **OVER THE PAST SIX WEEKS.** Please answer ALL the questions on the following pages simply by underlining the answer you think most early applies to you. Remember that we want to know about your present and recent complaints, not those that you had in the past.

HAVE YOU RECENTLY:-

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4.	felt capable of making decisions about things?	More so than usual	Same as usual	LEss so than usual	Much less capable
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15.	felt on the whole you were doing things well?	Better than usual	About the same	Less well than usual	Much less well
16.	been satisfied with the way you've carried out your task?	More satisfied	About same as usual	Less satisfied than usual	Much less satisfied

If you have any further comments about your work, health, or this questionnaire which you think maybe useful to this research, please note them below.

Finally, please check that you have answered all the questions.

THANK YOU