

**THE RELATIONSHIP BETWEEN BURNOUT, COPING AND SENSE OF
COHERENCE AMONGST ENGINEERS AND SCIENTISTS**

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SUMMARY

Engineers and scientists have to cope with the challenges of a complex work environment. This study investigated the relationship between burnout, coping and sense of coherence amongst engineers and scientists.

The Maslach Burnout Inventory, COPE and Sense of Coherence questionnaires were used. The study was conducted with 272 engineers and scientists at a global petro-chemical company with its head office based in South Africa.

A theoretical relationship was determined and an empirical investigation provided evidence of such a relationship. The results confirmed a relationship between burnout, coping and sense of coherence amongst engineers and scientists.

KEY TERMS

Burnout, coping, sense of coherence, emotional exhaustion, stress, depersonalisation, cynicism, personal accomplishment, professional efficacy, salutogenesis

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CHAPTER 1

SCIENTIFIC INTRODUCTION TO THIS STUDY

This dissertation focuses on the relationship between burnout, coping mechanisms and sense of coherence amongst engineers and scientists. In this chapter the background to the study is formulated, that flows into the formulation of a problem statement and research questions. Stemming from the aforementioned, the aims of the research are then stated. The paradigm perspective which guides the research is discussed and the research design (strategy) and research method with its different steps, giving structure to the research process, are formulated. Finally the sequence in which the chapters will be presented is introduced.

1.1 BACKGROUND TO THE RESEARCH

Since burnout was popularised as a behavioural phenomenon by Freudenberger (1974; 1975; 1982; 1983; 1985), Maslach (1976; 1978) and Pines (1993; Pines & Aronson, 1981; 1988), extensive research has been done on the construct as found in different careers (Cordes & Dougherty, 1993). Burnout as a phenomenon was originally observed primarily among people helpers such as nurses, social workers and police officers. More specifically, burnout is studied in the so-called “people work” careers because of the prevalence of intense feelings of tension, anxiety, embarrassment, fear and hostility (Cherniss, 1995; Maslach, 1982). However, today it is acknowledged that people in almost any occupation could develop burnout (Cox, 1990). The effects of high stress levels on individuals in the work environment are many and varied (Cameron et al., 1994; Noble, 1993). Stress may lead to lower productivity, real and imagined pain disorders, absenteeism, staff turnover, and substance abuse.

Vines (1991) recommended that research in nursing should not only focus on coping and coping methods to control burnout but that additionally, it should search for mediating variables such as self-esteem, motivation and personality. Since the 1980's the focus in the social sciences has in fact moved away from studying stress and general coping behaviour from an abnormal behavioural paradigm, towards studying specific personality coping constructs derived from the positive psychology (Seligman, 1990) and salutogenesis paradigms (Antonovsky, 1979; Breed, 1998).

From the above research it seems that individual salutogenic constructs are relevant in understanding ways of coping with burnout amongst employees. A study of the relationship between burnout, coping mechanisms and sense of coherence amongst engineers and scientists would further knowledge of and insight into this behavioural phenomenon.

1.2 PROBLEM STATEMENT

It is acknowledged that people in almost any occupation could develop burnout (Cox, 1990). However, very little research could be found on burnout amongst engineers and scientists. The persistent, negative, work-related state of mind (or syndrome) associated with burnout develops gradually over time in originally highly motivated, striving, achieving and non-compromising individuals with good intentions and high expectations (which are sometimes out of touch with reality), who stretch themselves beyond the normal work boundaries for a long period of time in their quest for meaning (Jackson, 1982; Maslach, 1976; 1982; 1993; Maslach & Jackson, 1982b; 1984; Pines & Aronson, 1981; 1988; Schaufeli & Enzmann, 1998). Engineers and scientists are highly qualified individuals with challenging careers who can easily fall victim to burnout.

Often, burnout is self-perpetuating because of inadequate coping strategies that are associated with the syndrome and may lead to an array of behaviours such as helplessness, hopelessness, disillusionment, a negative self-concept, negative attitudes towards work, people and life itself (Cherniss, 1995; Golembiewski & Munzenrider, 1988; Jackson, Schuler & Schwab, 1986; Maslach, 1982a; 1982b; Maslach & Jackson, 1984; 1986; Schaufeli & Enzmann, 1998).

Within the salutogenic paradigm, the focus of the research should shift from studying the pathological parts of the human beings toward studying the 'healthy' aspects of human behaviour. This could further the understanding of how most individuals remain well adjusted despite their exposure to the stresses and strains of modern life. (Rosenbaum, 1988).

The experimental organisation in this study, one division of a large petro-chemical firm, consists of 1420 employees, mainly chemical engineers and scientists. A typical engineer and scientist within this group would be in the possession of a BSc. degree from a recognised university. The experimental organisation is also referred to as the "brain" behind the group. The company's process line runs from the initial idea generation stage (research and development), through conceptual packaging and project execution, to operations improvement and optimisation. The company possesses no other assets than the intellectual property of its employees. The study examined the two groups, namely engineers and scientists.

The experimental organisation is exposed to extreme situations. The company also competes with external consulting engineering companies. The advantage is that this organisation is an in-house group that knows and understands the petro-chemical industry. The organisation has a very intensive focus on training and development, with on average an annual intake of about 200 young graduates from South African universities. These

young engineers are exposed to large projects at a very young age. These projects are also linked to major financial implications for the company. The organisation operates in a global environment. Its major business is based in Sasolburg and Secunda, but a large portion of its operations exists in Europe, the United States and the Middle-east. Globalisation has brought about a situation where engineers / scientists are away on business trips for long periods. The challenge is always to focus on continuous improvement. Projects are driven with a very strong focus on quality, costs and time. Within this scenario, many symptoms of burnout manifest, while at the same time evidence of poor psychological coping manifests. It is therefore suggested that these engineers/scientists often function low on psychological wellness constructs, in this case sense of coherence. Exactly how high or low these constructs manifest and what the relationships between them are not clear.

The question raised by the literature used in this research can be formulated as: how are burnout, coping and sense of coherence conceptualised and how do they relate with one another?

The empirical question raised by this research can be formulated as: what is the nature of the psychometric relationship between burnout, coping and sense of coherence amongst these engineers and scientists and what recommendations can be formulated in terms of this relationship for future organisational functioning as well as research?

1.3 AIMS OF THE STUDY

The general aim of this study was to investigate the relationship between burnout, coping and sense of coherence amongst engineers and scientists.

The specific literature aim was to investigate the theoretical relationship between burnout, coping and sense of coherence.

The specific empirical aim was to investigate the nature of the psychometric relationship between burnout, coping and sense of coherence, and to formulate recommendations in terms of this relationship.

1.4 THE PARADIGM PERSPECTIVE

Research is based upon certain scientific achievements, achievements that are acknowledged and accepted by a given scientific community as the basis for further research. These achievements are referred to as paradigms (Mouton & Marais, 1990). The research will be conducted according to the salutogenic paradigm (Antonovsky, 1983) whereby, firstly human beings are regarded as proactive, self-aware subjects, intentionally intervening within a socially constructed world. Secondly, salutogenesis assumes that society is mutable and that human subjectivity and action may alter concomitantly, in contrast to the universal laws of the natural sciences. Thirdly, importance is accorded to on the social context within which an individual functions. This means that human behaviour is predominantly governed by the social rules which people generate to understand their world, instead of being an oversimplification of a limited range of proximal variables which are easier to measure and control (Handy, 1990).

Within the salutogenic paradigm the focus is on how the individual, despite the omnipresence of stressors, stays healthy. The paradigm also accepts that stressors are neutral in their health consequences for the individual. Furthermore, that the consequences for the individual depend on his or her response to the stressor (Antonovsky, 1979).

Industrial and organisational psychology is seen as the scientific study of human behaviour and psychological conditions in the work-related aspects of the individual's life. The purpose is to use relevant knowledge to minimise

problems in this context. Put differently, industrial and organisational psychology is the study of human behaviour, attitudes and performance within an organisational setting (Gibson et al, 1991).

1.5 RESEARCH DESIGN

According to Mouton and Marais (1990) a distinction can be made between exploratory, descriptive and explanatory research. The present research design is partly descriptive and partly explanatory. It is descriptive in the presentation of the burnout and salutogenic constructs and the relevant theoretical models. The important consideration in a descriptive study is to collect accurate information on the domain phenomena which are under investigation. The present research design is, however also partly explanatory. Mouton and Marais (1990) postulate that the purpose of explanatory research is the indication of causality between variables or events. There is also the added feature of direction and not just causality. The goal of this study is evaluative, to determine whether and if so how the salutogenic variables influence the experience of burnout. From the above it becomes clear that combinations of different research goals and strategies are not only possible, but when utilised innovatively, can be expected to answer the research questions posed in this research.

1.6 RESEARCH METHOD

The research method consists of a literature review and an empirical study. The literature review focuses on previous research that has been done on burnout, coping and sense of coherence. The results are used to determine the relationship among burnout, coping and sense of coherence.

1.6.1 Phase 1: Literature review

Phase 1 entailed a literature review in the form of descriptive research.

Step 1: Conceptualising burnout

Step 2: Conceptualising coping

Step 3: Conceptualising sense of coherence

Step 4: Theoretical integration of these three concepts to determine a theoretical relationship between burnout, coping and salutogenesis.

1.6.2 Phase 2: Empirical study

Phase 2 entailed a quantitative empirical study.

Step 1: *Determining the population and sample.* Data was collected from a large petro-chemical company in South Africa. It is an international company with operations mainly in South Africa. The population comprised engineers and scientists at this institution and the sample was made up of those engineers and scientists who responded to the invitation requesting their participation in the research project. A sample of N=50 or higher was regarded as large enough to ensure useful data.

Step 2: *Measuring instruments.* The Maslach Burnout Inventory (MBI) developed by Maslach and Jackson (1981) was used to measure burnout. The COPE questionnaire (Carver et al., 1989) is used to measure coping mechanisms. The Sense of Coherence

questionnaire (SOC) (Antonovsky, 1983) is used to measure those personality factors which promote coping and well-being.

Step 3: *Data collection and administration.* Permission was obtained from the management of the organisation to administer the instruments. Sessions were arranged for employees to complete the instruments.

Step 4: *Scoring and statistical processing.* The data was processed according to the requirements for each inventory. Descriptive statistics (means and standard deviations) were used because they form a vital part of statistical analysis. This enabled the researcher to analyse the data. Correlation analysis was performed to determine possible relationships between the variables. The practical significance was also investigated for profiling purposes. Statistical analysis was carried out by Prof. Ian Rothmann from the Potchefstroom University with the help of the SAS programme (SAS Institute, 1999).

Step 5: *Hypothesis.* The hypothesis was formulated, to be revisited after the reporting of the results.

Step 6: *Results.* The results were reported and interpreted according to the empirical aim.

Step 7: *Conclusions.* Conclusions were drawn with reference to the literature review and empirical study.

Step 8: *Limitations.* The limitations of the research were formulated.

Step 9: *Recommendations.* Recommendations were made with reference to this particular organisation, the field of individual and organisational psychology and future research.

1.7 CHAPTER DIVISION

The chapters of the dissertation were divided as follows:

Chapter 2: Burnout , Coping and Sense of Coherence

Chapter 3: Empirical study

Chapter 4: Results

Chapter 5: Conclusions, limitations and recommendations

1.8 CHAPTER SUMMARY

The scientific orientation of the research was discussed in this chapter, consisting of the presentation of the problem statement, aims, paradigm perspective, research design, research methodology and chapter division. Chapter 2 deals with the concepts of burnout, coping and sense of coherence.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to conceptualise and define burnout, coping and sense of coherence, by a survey of the existing literature. The history and background of burnout, coping and sense of coherence will be discussed together with various definitions. The development, characteristics and symptoms of burnout, coping and sense of coherence and the applications of these concepts will also be examined.

2.1 BURNOUT

2.1.1 History and background of the constructs of burnout

During the past two decades, the construct of burnout has received considerable attention within the helping professions. Freudenberger (1974) is generally considered to be the father of the concept of the burnout syndrome. The origin of "burnout" and the development of the concept is well documented in the literature (Burgess, 1980; Freudenberger, 1974, 1975, 1982, 1983, 1985; Maslach, 1976, 1978; Maslach & Jackson, 1977, 1982; Pines & Aronson, 1981). In recent years there has been increased interest in the effects of job stress and strain in workers in nearly every kind of occupation.

The human cost of burnout has been acknowledged since the 1930's and 1940's, when American industry experienced an epidemic of executives dying of heart disease (Freudenberger, 1974). Since then, burnout has been linked to hypertension, coronary disease, migraine and tension headaches, peptic ulcers, renal disease and asthma. Physicians believe unrelieved burnout can lead to depression and to breakdown in normal relations with friends, family and colleagues (Freudenberger, 1974). Visible suffering

caused by many work environments has focused the attention of labour leaders, legislators, and researchers on the need to protect workers from physical harm. Until recently the potential of the work environment to cause mental harm or distress has received less attention.

2.1.2 Definition of burnout

The term *stress* refers to the individual's experience of those environmental demands (or stressors) which are perceived as exceeding that person's available resources (Lazarus, 1976). Stress may lead to the experience of strain (Cooper, 1986; Handy, 1990; Harrison, 1983; Lazarus & Folkman, 1984). This relationship is moderated by certain intervening variables, which further affect the deleterious impact on the individual (Beehr & Newman, 1978; Cox, 1978; Kobasa, 1982; Lazarus, 1966, 1976; Maddi & Kobasa, 1984; Pearlin et al., 1981; Pearlin & Schooler, 1978). Prolonged stress is often followed by burnout.

The Oxford dictionary defines *to burn out* as to fail, wear out, or become exhausted by making excessive demands on energy, strengths, or resources. *Burnout* could be seen as a metaphor commonly used to describe a state or process of mental exhaustion, similar to the smothering of a fire or the extinguishing of a candle (Schaufeli & Buunk, 1996). Burnout can therefore be seen as a state or a process.

Regelson's (1989) definition states that in essence, burnout reflects dissatisfaction with one's workplace, domestic situation and or social or political conditions. Burnout, according to Richelson and Freudemberger (1980), could be defined as the experience of someone in a state of fatigue or frustration brought about by devotion to a cause, way of life, or relationship that has failed to produce the expected reward.

Veninga and Spradley (1981) defined burnout as a debilitating psychological condition brought about by unrelieved work stress. A further compression of the term burnout was advanced by Edelwich and Brodsky (1980), who restricted their use of the term to the helping professions. They acknowledged that burnout could occur in virtually any profession but they maintained that it tends to assume special intensity and character in the human services professions.

Maslach and Jackson (1977) defined burnout as the loss of concern for the people with whom one is working including physical exhaustion and characterised by an emotional exhaustion in which the professional no longer has any positive feelings, sympathy, or respect for clients or patients. In fact Maslach (1976) noted that burned out professionals lose all concern, all emotional feelings for the persons they work with and come to treat them in detached or even dehumanised ways. These observations lead to the now well accepted definition by Maslach and Jackson (1982) of burnout as a syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment. Pines and Aronson (1981) defined burnout as the result of constant or repeated emotional pressure associated with intense involvement with people over long periods of time. As an erosion of spirit, burnout affects precisely those professionals who had once been the most idealistic and enthusiastic, the professionals who had at one time been "on fire".

Hallsten (1993) states that burnout is a chronic, negative, affective response, with fatigue and emotional exhaustion as its core aspects. Shirom (1989) concludes that burnout essentially refers to a combination of physical fatigue, emotional exhaustion and cognitive weariness.

What becomes clear in this definitional mixture is that burnout can be defined as purely work related, or as a combination of acute, delayed and

chronic stressors which have developed in work and non-work areas. This view of the burnout phenomenon can be referred to as the state conception of burnout, since it identifies burnout with affective states. Researchers within the field may have different opinions regarding the antecedents and consequences of the phenomenon, but most of them appear to adhere to this state conception of burnout (Hallsten, 1993).

Brill (1984, p. 15) proposed the following precise definition of burnout:

Burnout is an exceptionally mediated, job-related, dysphoric and dysfunctional state in an individual without major psychopathology, who has, (a) functioned for a time at adequate performance and effective levels in the same job situation and who, (b) will not recover to previous levels without outside help or environmental rearrangement.

Burnout is a syndrome which has been extensively researched by Maslach and Jackson (Maslach, 1978a, 1978b, 1982a, 1982b, 1982c; Maslach & Jackson, 1979, 1981, 1982, 1984a, 1984b) and others (see Shirom, 1989). Whilst a survey of the literature reveals a plethora of definitions of burnout, there is a common thread which may reveal a working definition of burnout that is shared by most people (Maslach, 1982). First of all, there is general agreement that burnout occurs at an individual level. Second, there is agreement that burnout is an internal psychological experience involving feelings, motives and expectations. Thirdly, there is agreement that burnout is a negative experience for the individual, in that it concerns problems, distress, discomfort, dysfunction and / or negative consequences (Maslach, 1982). Beyond these basic points, the consensus begins to break down. Nevertheless, there are some key dimensions of burnout on which there is agreement.

Perlman and Hartman (1982) define burnout as a response to chronic emotional stress with three components:

- (a) emotional and / or physical exhaustion;
- (b) mental exhaustion / lowered job productivity; and
- (c) depersonalisation.

They believe that research on burnout would benefit from a focus on its underlying primary dimensions, treating burnout as a multi-dimensional construct, not a single explanatory term. This view is supported in the present study.

Looking more closely at these components, exhaustion is also described as a wearing down, loss of energy, depletion, debilitation and fatigue. Although sometimes this exhaustion is a physical one, more often a psychological or emotional exhaustion is described as central to burnout; a loss of feeling and concern, a loss of trust, a loss of interest, a loss of spirit.

A second dimension is a negative response towards oneself and one's personal accomplishments, also described as mental exhaustion. Symptoms include lowered job productivity, depression, low morale, withdrawal and an inability to cope.

A third dimension found is a negative response towards others: depersonalisation, negative or inappropriate attitudes toward clients, loss of idealism, and irritability. Most discussion of this dimension emphasises its movement (in a negative direction) over time.

Thus, burnout is used as an umbrella term, referring to three related but loosely coupled reactions to a job (Jackson, Schwab & Schuler, 1986). The psychometric measure developed by Maslach and Jackson (1981): i.e., the Maslach Burnout Inventory (MBI), is designed to measure burnout in these terms.

2.1.3 The development of burnout

Although individual characteristics and coping strategies play an important role in the amount of burnout an individual might experience, a number of employment practices occurring within organisations tend to promote the development of the syndrome. Among these practices are limited input by employees into decision-making, disproportionate workloads among employees with similar job descriptions, the inability of individuals to reach career goals (such as promotion and recognition), poor communication between administrators and employees, inadequate staff development for maintaining skills and personal development, dysfunctional support systems, de-emphasis on relaxation programmes, and inadequate matching of personal characteristics to job demands (Beehr & Newman, 1978; Cherniss, 1980; Matthews, 1990).

Cherniss (1980a, p. 5) was among the first to propose a definition of burnout as a process: "Burnout refers to a process in which the professionals' attitudes and behaviour change in negative ways in response to job strain". More specifically: The first stage involves an imbalance between resources and demands. The second stage is the immediate, short-term emotional tension, fatigue, and exhaustion (strain). The third stage consists of a number of changes in attitude and behaviour, such as a tendency to treat clients in a detached and mechanical fashion, or a cynical preoccupation with gratification of one's own needs (defensive coping).

An important new etiological element is introduced by Cherniss (1980) in the third stage: the individual's way of coping with stress. Although Cherniss considers excessive job demands as the root cause of burnout, a defensive coping strategy, characterised by avoidance and withdrawal, fosters its development.

According to Etzion (1984) burnout is a slowly-developing process that starts without warning and evolves almost unrecognised up to a particular point. Suddenly and unexpectedly, one feels exhausted and one is not able to relate this devastating experience to any particular stressful event.

Etzion (1984) suggested that a continuous, barely recognisable, and for the most part denied, misfit between personal and environmental characteristics is the source of a slow and hidden process of psychological erosion. Unlike other stressful phenomena, the mini-stressors of misfit do not cause alarm and are rarely subject to any coping efforts. Thus the process of erosion can go on for a long time without being detected.

As remarked above, Maslach and Jackson (1980) are of the opinion that burnout is a syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment. Emotional exhaustion refers to a depletion of one's emotional resources and the feeling that one has nothing left to give to others at a psychological level. The depersonalisation phase of burnout is the development of negative and callous attitudes about the people one works with. The depersonalised perception of others can lead one to judge them as somehow deserving of their troubles. A third aspect of burnout is the perception that one's accomplishments on the job fall short of personal expectations – a perception which involves a negative self-evaluation.

Lyall (1989) remarked that there is an attitude problem that society has perpetuated, and still helps to foster throughout communities, that leads individuals to be proud of the fact that they strive to meet unrealistic expectations. According to Freudenberger and Richelson (1980) burnout is a problem born of good intentions. It is not a disgrace nor does it improve by being ignored. The people who fall to it are for the most part decent individuals who have striven hard to reach a goal. Their schedules are full,

and whatever the project or job, they can be counted on to do more than their share. They are burning out because they have pushed themselves too hard for too long. They started out with very high expectations and refused to compromise along the way. Lynn (1989) reminds us that burnout occurs only in achievers. Burnout tends to afflict people who are highly motivated and idealistic when they enter their professions, expecting their work to give their lives a sense of meaning (Cherniss, 1995; Pines & Aronson, 1988). It is a particular hazard in occupations in which professionals tend to experience their work as a kind of calling.

Because of prior learning, family background, current life circumstances, job experiences, appraisal skills, coping resources, and various other factors, certain individuals may be more predisposed to burnout than others. What can be accepted is that individuals participate in shaping their own environments. Those who have stereotyped, long-standing patterns of interacting with the world may invariably set themselves up for burnout. Burnout is a multidimensional phenomenon that defies simplistic analysis. The validity of the concept, however, is compromised when it is viewed so comprehensively that virtually nothing is excluded as to where and in whom burnout could take place, or as to its causes, symptoms and effects.

It is important to note that burnout has not been restricted to the human services professions in the literature. Burnout appears largely to be specific to the work domain. The idea that its origins lie in the job situation might have given rise to the extension of the burnout concept to other types of occupations. Maslach and Schaufeli (1993) quote Cahoon and Rowney (1984), and Etzion, Kafry and Pines (1982) as examples of discussions regarding burnout in business, corporate and managerial burnout. In conclusion, it is accepted that burnout is found in possibly all professions (Cordes & Dougherty, 1993). Such a perspective is accepted for the purposes of this study.

2.1.3.1 Biographical characteristics

Most studies do not systematically investigate biographical differences in burnout. Nevertheless, of all biographical characteristics, age is the most consistently related to burnout (Pines & Aronson, 1988). It seems that burnout occurs most frequently among young employees aged less than 30 to 40 years. On the other hand, in European countries such as the Netherlands, burnout is more prevalent in older age groups (Schaufeli & Buunk, 1996). This is probably because European employees are more reluctant to change jobs since cultural values and social security systems restrict their labour market mobility.

The observation is also made that burnout is negatively related to work experience. Burnout seems to occur at the beginning of one's career (Maslach, 1982; Pines & Aronson, 1988). It has been shown that young, unqualified and inexperienced workers report higher burnout scores, suggesting a "crisis in competence" (Harrison, 1983). The MBI manual (Maslach, Jackson & Leiter, 1996) also shows the decline of burnout symptoms together with growing age or increasing work experience for all three dimensions, but most clearly for depersonalisation and emotional exhaustion. Based on the theory of adaptation (Etzion, 1984), this higher burnout could occur because younger workers have not had the experience or time to develop effective coping strategies. However, the concept of emotional exhaustion seems to indicate that burnout may also be experienced by relatively well-trained workers, who have been in the field for some time and who have simply "run out of steam".

Research suggests that there is an association between burnout and gender roles (Caccesse & Mayerberg, 1984; Maslach & Jackson, 1981). Initially, it was claimed that women report higher burnout levels than men (Etzion & Pines,

1986; Maslach & Jackson, 1981), but the opposite is also found (Seligman, 1990). Women tend to score slightly higher on emotional exhaustion. Certain studies suggest that differences between genders may be especially noted with respect to depersonalisation. Males appear to be depersonalised by their professional responsibilities more often and more intensely than their female counterparts (Maslach & Jackson, 1985). It has been suggested that this tendency occurs because of gender-role socialisation or sex role-dependent stereotypes (Maslach & Jackson, 1985; Schaufeli & Enzmann, 1998).

Most studies show that those who are unmarried (especially men) have an increased risk of burning-out compared to those who are married (Maslach & Jackson, 1985). Single people seem to experience even higher burnout levels than those who are divorced (Maslach et al., 1996).

Finally, research has found that individuals with a higher level of education were more prone to burnout than less educated employees (Maslach & Jackson, 1981). This is probably because highly-educated individuals have higher expectations and often obtain positions with more responsibility (over other persons) (Schaufeli & Enzmann, 1998). This is quite remarkable since most stress-related problems seem more prevalent among workers with low status and poor education (Maslach & Jackson, 1981).

2.1.3.2 Work and organisational characteristics

It has been argued that burnout should also be considered within an organisational context (Golembiewski & Muzenrider, 1988). Indeed, a vast array of research has demonstrated that burnout is positively related to particular job and organisational characteristics. To the extent that others in an organisation control professional activities and pathways are blocked by

organisational processes and structures, individuals cannot attribute success to themselves, which could lead to a crisis in self-efficacy (Leiter, 1992).

More recently, perceived organisational inequity has also been linked to professional burnout (Schaufeli & Buunk, 1996). When rewards (e.g. salary, positive feedback or career advancement) provided by the organisation fall short of what one feels one deserves in terms of inputs, burnout may develop. Furthermore, research supports a modest yet consistent relationship between stress, psychosocial variables, and organisational outcomes (Cordes & Dougherty, 1993). Stressors such as poor communication, heavy job demands, inadequate training, interpersonal conflict, the inability to reach aspired career goals and organisational withdrawal behaviors (e.g. turnover, intention to quit, absenteeism and tardiness) have been strongly associated with low productivity and health problems (Cordes & Dougherty, 1993; Schaufeli and Buunk, 1996). Research in burnout has also focused on the environmental factors surrounding some jobs, including long hours (Pines & Maslach, 1978), and inadequate facilities (Maslach & Pines, 1997). Schaufeli and Enzmann (1998) divide these work and organisational characteristics into job demands (job-related stressors and client-related stressors) and resources (social support and factors that determine self-regulation of work activities).

Role stress, which includes role conflict, role ambiguity and role overload, is the most widely investigated correlate of burnout (Perlman & Hartman, 1982). Each of these role stressors has been found to be significantly associated with the experience of burnout (Cordes & Dougherty, 1993). Other job demands, such as the number of hours worked per week, the amount of direct client contact, caseload, and the severity of client problems, are only studied occasionally. Generally, correlations with burnout are lower but nevertheless lie in the expected directions: employees experience more burnout when they work more hours per week, interact frequently with recipients, have high workloads, and have to deal with severe client problems (Gibson et al, 1991;

Maslach & Jackson, 1984b). Job demands clearly correlate least with personal accomplishment and most strongly with emotional exhaustion (Maslach & Jackson, 1984b).

An abundance of empirical studies confirms the negative relationship between burnout and social support. Etzion (1984), Leiter and Meehan (1986) report that social support from colleagues, supervisors, clients and family is associated with less burnout. Leiter (1988) found that emotional exhaustion in staff nurses was associated with decreased levels of supervisor support. Similarly, Freudenberger (1985) found that an open and supportive nurse supervision style led to a reduction in role ambiguity, improved job satisfaction, reduced absenteeism, and more supportive relations among co-workers. Cooper (1986) also found a link between lower levels of supervisor support and a higher risk of burnout among staff nurses. According to Schaufeli and Buunk (1996), there is longitudinal evidence for a main or direct effect of social support as well as for an indirect or stress-buffering effect. It also seems that support from supervisors is more effective in alleviating burnout than support from co-workers (Cooper, 1986).

Lack of feedback is positively related to all three burnout dimensions. A meta-analysis of six studies showed that lack of feedback explains 18% of the variance of emotional exhaustion, 12% of depersonalisation, and 9% of reduced personal accomplishment (Schaufeli & Enzmann, 1998). Similarly, participation in decision making and autonomy is consistently negatively related to burnout, although the latter relationship is much weaker (Schaufeli & Enzmann, 1998).

2.1.3.3 Burnout and personality

In the development of burnout, the role of personality characteristics or traits on the one hand and situational determinants on the other is a complicated

issue. According to Maslach (1982, p. 10), "many people have a general tendency to overestimate the importance of personal factors, while simultaneously underestimating situational ones". Maslach (1982) added that the burnout syndrome appears to be a response to chronic, everyday stress (rather than to occasional crisis). The emotional pressure of working closely with people is a constant part of the daily job routine, but a tolerance for this continual stress changes over time. This tolerance gradually wears away under the never-ending onslaught of emotional tensions. Since the job is a constant factor, while the person's problems vary over time, the person is unable to see a situational cause that coincides with the effect (Maslach, 1982). If the appropriate situational causes are not recognised or appreciated, one can be sure that attempted solutions for burnout will be misguided or incomplete. Therefore, situational analysis of burnout should not be underestimated or neglected.

On the other hand, related literature on coping and well-being identifies personality as an important factor (McCrae & Costa, 1986). According to Shirom (1989), much research overlooks the potentially mediating effects of individual difference variables. It is possible that individuals may vary in their sensitivity to stress; thus, these job characteristics may be more problematic for some than for others. Further, the reliance on concurrent correlation paradigms prohibits any causal inferences. In a longitudinal study of teachers by Jackson et al. (1986), no job conditions predictive of later burnout were found. Such null results open the door for the hypothesis that qualities of the individual, in addition to qualities of the job, may predispose one to emotional burnout. Environmental factors may be relevant only to the degree that they enable individuals to express their own levels of distress. This is consistent with current longitudinal research that demonstrates that temperamental dispositions are more powerful predictors of psychological distress than are environmental factors (Ormel & Wohlfarth, 1991).

Recent work on burnout indicates that both the individual and the environment play important contributing roles (Schaufeli, Maslach & Marek, 1993). According to Schaufeli and Enzmann (1998, p. 77) a high correlation between burnout and personality does not necessarily imply causality, but rather that “individuals may put themselves in situations that match with their personality and such situations may foster burnout”. Furthermore, personality characteristics can moderate the effect of stressful situations on burnout in such a way that certain traits may buffer or enhance negative outcomes. Thus, personality and situational variables interact in complex ways. As a result, it is difficult to interpret the meaning of correlations of burnout with personality traits.

2.1.4 The characteristics of burnout

The distinctiveness of burnout from other related and more familiar psychological constructs is an important issue. Professional burnout has been equated with a myriad of terms, most of which are plagued by the same sort of definitional ambiguity: tedium, stress, job dissatisfaction, depression, alienation, low morale, anxiety, strain, tension, feeling “worn-out”, “nerves”, boredom, chronic fatigue, poor mental health, personal crisis, professional melancholia and vital exhaustion (Maslach & Schaufeli, 1993). According to Schaufeli and Enzman (1988) the following question must be answered: Is burnout a truly new phenomenon? In answering this question, Schaufeli and Enzmann consider only the distinctiveness of burnout from job stress, depression and chronic fatigue.

2.1.4.1 Burnout and occupational stress

In the burnout literature, stress is often equated with burnout. Though these two concepts are similar, they are not identical. Cordes and Dougherty (1993), have stated that despite the growing consensus surrounding the

burnout concept, the distinction between burnout and stress has not been clearly delineated. Most people associate stress with a response to a major event. What is not so well understood is the enormous toll in physical, mental and emotional resources demanded by longer-term, frequently low level, stress (Mitchel & Bray, 1990). Stress of this type has been called chronic stress or cumulative stress. In the present study, cumulative stress is viewed as burnout. It is made up of a collection of stressful events, such as critical incidents, combined with work-related, home-related or family-related stressors. They may also be mixed with organisational stressors, routine job stressors, and leftover stressors from one's early childhood development. In similar vein Ganster and Schaubroeck (1991) have argued that burnout is in fact a type of stress – specifically, a chronic affective response pattern to stressful work conditions that feature high levels of interpersonal contact. Burnout is a distinctive aspect of stress in that it has been defined and studied primarily, but not exclusively, as a pattern of responses to stressors at work (Pines & Aronson, 1988). The burnout response syndrome is largely initiated by external demands and circumstances, including interpersonal stressors. The notion that one's psychological environment, life style, and attitudes are linked to disease is by no means a new idea.

According to Lazarus and Folkman (1984), occupational stress occurs when job demands tax or exceed the person's adaptive resources. Stress is thus a generic term that refers to the temporary adaptation process that is accompanied by mental and physical symptoms and is caused by an imbalance between job demands and the response capability of the worker. When job demands are too high to cope with, stress reactions are likely to occur. In contrast, burnout can be considered as a final stage in a breakdown in adaptation that results from the long-term imbalance of demands and resources and is accompanied by chronic malfunctioning at work. Burnout can thus be considered as a particular kind of prolonged job stress (Brill, 1984), or the outgrowth of chronic, ongoing stress.

Burnout is also distinct from occupational stress in that it is a multidimensional syndrome that includes, in addition to energy depletion, the development of negative, dysfunctional attitudes and behaviours at work. Stress responses at work include physical, psychological (affective, cognitive, motivational) and behavioural symptoms. It seems that burnout is a particular, multidimensional stress-response that includes characteristic negative, job-related attitudes and behaviours that are not covered by the traditional job stress concept (Schaufeli & Enzmann, 1998). Schaufeli and Buunk (1996) empirically supported this assertion.

Finally, it has been claimed that everybody can experience stress, while burnout can only be experienced by those who entered their careers enthusiastically with high goals and expectations (Schaufeli & Buunk, 1996). Pines(1993) has argued that individuals who expect to derive a sense of significance from their work are susceptible to burnout. Those without such expectations would experience job stress instead of burnout. Thus, burnout is depicted as a process gradually worsening over time, and resulting from a build-up of chronic stress stemming from emotionally demanding situations (Etzion, Kafry & Pines, 1982).

2.1.4.2 Burnout and depression

According to Maslach and Schaufeli (1993), the diversity of burnout causes, symptoms, definitions, and consequences has contributed much to the confusion about the specificity of burnout. Burnout can only be distinguished in a relative way from other related concepts. It should be mentioned that concepts such as stress, depression and job satisfaction are plagued with the same sort of definitional ambiguity as burnout. It should further be noted that there are no clear boundaries between burnout and these other concepts. According to Maslach and Schaufeli (1993), there is a relative distinction

between burnout and stress, with regard to the time they take to develop. Furthermore, there is a distinction between burnout and both depression and job satisfaction with respect to domain.

The relationship between burnout and depression has been debated. The following distinctions have been made between the two concepts (Maslach & Jackson, 1986).

Unlike depression, a mental disorder with a pervasive influence on a full range of life activities, burnout has been conceptualised as influencing primarily human service workers' thoughts and feelings about professional performance (Leiter & Maslach, 1988; Maslach & Jackson, 1986). The impact of burnout on family relationships is considered an indirect effect, rather than an intrinsic part of the syndrome (Leiter, 1990; Maslach & Jackson, 1986).

Depression is most often accompanied by guilt, whereas burnout generally occurs in the context of anger (Freudenberger & Eichelson, 1990).

Depression concerns context-free affective well being, whereas burnout concerns job-related affective well being. That is, the symptoms of burnout tend to be job-related and are situation-specific rather than pervasive. In the early stages of burnout, people often still feel happy and are productive in other areas. But "real" depression is characterised by a generalisation of the person's symptoms across all situations and spheres of life (Freudenberger & Richelson, 1990; Warr, 1987)

Burnout has both convergent and divergent validity with depression. There is substantial overlap between depression and emotional exhaustion (both share about 25% of their variance) but not with the other two dimensions of the burnout syndrome, depersonalisation and reduced personal accomplishment (they share less than 10% of their variance). Further,

burnout, unlike depression, necessarily has its origins in the job setting and is characterised by cynicism (Schaufeli & Buunk, 1996). Leiter (1993) attempted to answer the question whether depression may be a cause or a consequence of burnout. Unfortunately, he could not find support for either causal relationship: it seems that burnout can be a consequence as well as a cause of depression. Schaufeli and Enzmann (1998) provide three explanations for the correlations between depression and burnout (emotional exhaustion). First, burnout and depression share common symptoms such as low energy, poor work motivation and negative attitudes. Second, neuroticism may underlie depression as well as emotional exhaustion. Third, common external causes might exist. Finally, a study among nurses suggested that burnout leads to depression instead of the other way around (Leiter, 1993).

2.1.5 The symptoms of burnout

According to Schaufeli and Enzmann (1998), psychological symptoms can be classified into five clusters: affective, cognitive, physical, behavioural and motivational. Additionally, three more levels include individual, interpersonal and organisational symptoms.

2.1.5.1 Affective symptoms

At an individual level, a gloomy, tearful and depressed mood can be observed. Moods may change quickly, spirits are generally low, and emotional control might be decreased, which could lead to undefined fears, anxiety and nervous tension. In interpersonal contacts, the person suffering from burnout can be irritable and oversensitive, or cool and unemotional, showing lessened emotional empathy with recipients. Organisational symptoms include professionals feeling uncomfortable at work, and their job satisfaction is low (Schaufeli & Ezmann, 1998).

2.1.5.2 Cognitive symptoms

Cognitive skills might be impaired. Burned-out workers may not be able to concentrate for a long period, tend to be forgetful and make all kinds of minor mistakes and errors. Thinking becomes more rigid, schematic and detached. Emotional and personal issues and problems are intellectualised, and decision-making becomes increasingly difficult. Instead of actively solving problems, there is a tendency to run away from reality by daydreaming and fantasising. As a result, loneliness may develop. The individual's frustration tolerance is also diminished (Schaufeli & Enzmann, 1998).

An important characteristic symptom of burnout at interpersonal level is the decreased involvement with others. Cognitively, this is reflected by negativism, pessimism, lessened empathy and stereotyping. People might even blame others for their own fate. By derogating, stereotyping and blaming others a psychological distance is created which protects or enhances the self. This might foster an air of grandiosity or of righteousness. Furthermore, the individual could be resentful and may show hostility and suspicion.

At the organisational level, burned-out professionals feel helpless, hopeless and powerless. They feel out of control, while work loses its meaning and the individual feels trapped. A sense of failure, as well as a feeling of insufficiency and impotence, may lead to poor job-related self-esteem. The professional is preoccupied with him- or herself and feels guilty because he/she is not able to perform as usual on the job. Suicidal ideas may develop. The burned-out professional is resentful and shows hostility towards colleagues and supervisors. Frustrations, anxiety and problems are projected onto others and even paranoia might develop. A lack of personal effectiveness and cynicism

might be experienced. Burned-out professionals do not feel appreciated and are hyper-critical – distrusting management, peers and supervisors (Schaufeli & Enzmann, 1998).

2.1.5.3 Physical symptoms

Physical symptoms of burnout can be grouped into three categories (Schaufeli & Enzmann, 1998).

(a) Physical distress, such as headaches, nausea, dizziness, restlessness, nervous tics and muscle pains, particularly neck and lower back pain. In some cases hyperventilation occurs which can cause peculiar sensations including prickling limbs, dry throat, heart palpitations and heavy perspiration. The individual may experience anxiety and can be afraid of losing control over his or her body. In addition, sexual problems, sleep disturbances, sudden loss or gains of weight and shortness of breath are reported. Furthermore, chronic fatigue, drowsiness and bodily weakness are all physical symptoms.

(b) Psychosomatic disorders, such as ulcers, gastric-intestinal disorders and coronary heart disease may appear. Less serious are prolonged colds and flu that could be considered to be a consequence of prolonged stress. Pre-existing disorders like asthma, diabetes or rheumatoid arthritis are sometimes observed, as well as risk-taking behaviours and injuries such as fractures.

(c) Physiological reactions include increased heart rate and respiration rate, hypertension, high levels of serum cholesterol, and a decrease of the electrical resistance of the skin due to increased perspiration.

2.1.5.4 Behavioural symptoms

According to Schaufeli and Enzmann (1998), behavioural symptoms include hyperactivity, an inability to concentrate and acting directly and impulsively. In contrast, procrastination, doubt and indecisiveness are also observed. The consumption of stimulants such as coffee and tobacco increases, as does the use of alcohol, tranquillizers, barbiturates or illicit drugs. Over-and under-eating, accident-proneness and high-risk-taking behaviours also characterise this level. Two patterns emerge at the interpersonal level. First, a tendency exists towards aggressive or violent behaviour. Sudden and un-expected outbursts of rage and interpersonal conflicts may occur. Second, social isolation and withdrawal can occur. One of the most obvious characteristics is the decreased involvement with others. The person responds in a detached and mechanical manner. Also, psychological distancing devices are used, such as jargon or sick humour. The person's attitude of hopelessness, helplessness and meaninglessness is communicated verbally and / or non-verbally. Interpersonal conflicts with colleagues and supervisors as well as with one's spouse and children can develop. At the organisational level, burnout is characterised by reduced effectiveness, poor work performance, and minimal productivity. The quantity and quality of performance deteriorate, work is done less accurately and more mistakes are made. Withdrawal behaviours such as lateness, turnover, increased sick leave and absenteeism indicate the person's poor commitment. These behaviours could result from feelings of inequity and resentment. Frequent clock watching, "going by the book", being over-dependent on one's supervisors, scepticism and an exceptionally strong resistance to change signify withdrawal and poor commitment. Finally, particular skills are impaired, such as the ability to organise and the ability to manage one's time adequately.

2.1.5.5 Motivational symptoms

At the individual level, the person's intrinsic motivation has vanished (Schaufeli & Enzmann, 1998). Zeal, enthusiasm, interest, and idealism are lost, while disillusionment, disappointment and resignation set in. At the interpersonal level a loss of genuine interest in others, indifference, and discouragement are expressed. Occasionally, recipients are unscrupulously misused to meet personal and social demands. Present poor and / or inappropriate motivation stands in sharp contrast to initial idealism and drive. Over-involvement with others is sometimes observed as an early stage of burnout, which is followed by disillusionment and discouragement. The organisational level is characterised by poor motivation, strong resistance to go to work and dampened initiative.

Discussion

Although burnout is a multidimensional phenomenon that defies simplistic analysis, the validity of the concept is compromised when it is viewed so comprehensively that virtually nothing is excluded as a cause, symptom, or effect. The parameters of burnout need to be clarified and its symptoms viewed in terms of extremes. Etiological explanations must take into account the fact that some people burn out and others do not, even though they are exposed to the same conditions. The individualistic nature of burnout must be recognised as a function of the individual's relationship with the environment – with each individual relating to the environment in unique and qualitatively different ways.

Research has found that emotionally exhausted workers are less satisfied with their jobs, take more frequent work breaks, and have high rates of absenteeism (Maslach & Jackson, 1981). Lazarus (1977) concludes that it has become increasingly apparent that stress is important as a factor in illness in

general and in chronic illness in particular. Many present day illnesses cannot be explained in terms of a single cause. Research suggests that a significant portion of the population seeking medical care is suffering from stress-based illness. Jackson and Maslach (1981) point out that if a worker's job has a strong negative impact on family life, as might be the case when job stress is taken home, the worker may consider giving up the job to preserve the family. An alternative is to relinquish family and continue the job. To protect themselves from having to make such a choice many workers report that they try to maintain a separation between work and the rest of their lives by "leaving the job at the office".

In terms of personal functioning it is now believed that burnout plays a causal or exacerbating role in physical problems such as hypertension, stroke, coronary heart disease, ulcers, migraine headaches, tension headaches, gastro-intestinal illness, cancer, allergies, high blood pressure, asthma, rheumatoid arthritis, backaches, muscle tension, and temporal mandibular joint syndrome (Maslach & Leiter, 1997). Burnout may also lead to mental distress at the individual level in the form of anxiety, depression, psychosomatic complaints, health problems, and sleep disturbances. To try to cope with the stress, some people increase their use of alcohol and drugs. In addition to the chronic affective response pattern to stressful work conditions, the negative consequences of burnout for the individual can spill over to the individual's private life, which leads to the deterioration of family and social relationships (Burke & Deszca, 1986; Jackson & Schuler, 1983; Schaufeli & Enzmann, 1998).

Burnout has been linked to several negative organisational outcomes, including lower organisational commitment (Leiter & Maslach, 1988), increased turnover, low morale, and absenteeism (Jackson, Schwab, & Schuler, 1986), tendencies to withdraw from clients and take longer breaks, and decreases in job performance ratings (Maslach & Jackson, 1985; Wright

& Bonnet, 1997). Adverse effects on job performance include lowered productivity, high absenteeism, poor judgment, irritability, anger, and worker complaints. According to Cox (1990), managers suffering from burnout could hurt the organisation because they spread it to their subordinates. Any one of these behavioural outcomes of burnout is costly to an organisation.

There is a general agreement that burnout occurs at an individual level, that it is an internal experience that is usually psychological in nature, and that it is perceived by the individual as a negative experience (Jackson, 1982).

According to Maslach and Jackson (1986) the three dimensions of burnout (emotional exhaustion, depersonalisation, and reduced personal accomplishment) are included in the most widely-used and well-validated self-report questionnaire, the MBI (Maslach & Jackson, 1986; Maslach & Leiter, 1997):

Emotional exhaustion is believed to be at the core of burnout. Individuals experiencing emotional exhaustion in their jobs report overwhelming feelings of emotional strains, as well as feelings of being drained and used up, frequently irritable, frustrated and simply worn out – both emotionally and physically. Workers feel they are no longer able to give of themselves at a psychological level. Their emotional resources are depleted, and there is no source of replenishment. One way people try to move out from under their emotional burden is by detaching themselves psychologically from any meaningful involvement with others. This detachment puts some emotional distance between oneself and the people whose needs and demands are overwhelming. Exhaustion is the first reaction to the stress of job demands or major change.

Depersonalisation refers to the development of negative, impersonal and cynical attitudes and feelings about one's clients, in which the worker treats

other people like objects. Depersonalised workers take a cold, distant attitude toward work and the people on the job and minimise their involvement at work. This callous or even dehumanised perception of others can lead staff members to view their clients as somehow deserving of their troubles. It is as though the individual is viewing other people through rust-coloured glasses – developing a poor opinion of them, expecting the worst from them, and even actively disliking them. Depersonalisation is an emotional separation not only from one's clients but also from one's colleagues and eventually from one's self. Feeling negatively about others can progress until it involves being down on oneself. After a while, caregivers may feel distress or guilt about the way they have thought about or mistreated others.

Reduced personal accomplishment is a third aspect of the burnout syndrome. It is the tendency to evaluate oneself negatively, particularly with regard to one's work with clients. Workers have a growing sense of inadequacy about their ability to relate to recipients, and this may result in a self-imposed verdict of "failure". Every new project seems overwhelming. The world seems to conspire against each of their attempts to make progress and what little they do accomplish may seem trivial. This aspect thus constitutes the development of a reduced sense of personal efficacy, in which individuals negatively evaluate their work and their ability to cope.

It is believed that the burnout dimensions themselves may be interrelated (Golembiewski, 1989; Leiter, 1989, 1993). Specifically, it is believed that both emotional exhaustion and lack of personal accomplishment develop in parallel with (rather than following from) each other. Hence, both of these dimensions are posited to be reactions to different aspects of the work environment that pose difficulties for human service workers (Leiter, 1993).

According to Leiter (1993), emotional exhaustion arises first as a response to a demanding work environment that is, for instance, characterised by a lack of reciprocity at various levels. Increased exhaustion in turn brings about depersonalisation as people attempt to gain emotional distance from their colleagues by way of coping. Reduced personal accomplishment develops relatively independently from the other burnout dimensions, mainly as a function of lack of resources, such as poor autonomy and poor social support. Thus, emotional exhaustion and depersonalisation appear to be highly correlated, and personal accomplishment develops largely independently of them (Koeske & Koeske, 1989; Lee & Ashforth, 1993) but they are conceptually distinct constructs (Maslach & Jackson, 1981).

Pines and Aronson (1988) include physical symptoms, and also do not restrict burnout to the helping professions. According to them, burnout consists of the following three elements: a state of physical, emotional, and mental exhaustion caused by long-term involvement in situations that are emotionally demanding; physical exhaustion is characterised by low energy, chronic fatigue, weakness, and a wide variety of physical and psychosomatic complaints; and emotional exhaustion involves feelings of helplessness, hopelessness, and entrapment, which in extreme cases can lead to emotional breakdown.

According to Edelwich and Brodsky (1980) dissatisfaction with work often leads people to arrive late, leave early, extend work-breaks, or avoid work entirely. There is also the possibility of postponing client contracts, resisting client phone calls and office visits, stereotyping clients, and an inability to concentrate on what the client is saying, feeling intolerant of clients' anger, feeling immobilised and helpless, cynicism regarding clients and a blaming attitude. Edelwich and Brodsky (1980) also found evidence of depression, hostility and anxiety, as well as high incidents of turnover and absenteeism due to minor illness and vague somatic complaints.

2.1.6 The application of burnout

According to Cooper and Marshall (1980), many writers have tended to assume that engineers and scientists are so similar to each other that they can be automatically equated, without any need to make an empirical comparison between them. However, there may be important differences between engineers and scientists which render such assumptions invalid. Indeed, it is possible to go further and suggest that there may even be important variations in the experiences of engineers working in different branches of engineering. Also, there have been very few attempts to study technologists in relation to non-technical white-collar occupations, in order to isolate work pressures and strains which are unique to technologists and which are not common to white-collar occupations in general. Many of the existing studies examined individuals at a single stage in their career, often after they had been in employment for several years. Thus little is known about how work pressures vary at different career stages, or about how individuals attempt to adjust to work pressures over time (Cooper & Marshall, 1980).

According to Cooper and Marshall (1980) a number of writers have argued that scientists and engineers who work in industrial organisations are likely to experience conflict between their professional values and the goals of the organisations for which they work. It is suggested that professional values are incompatible with organisational values in a number of respects. According to Cooper and Marshall (1980), the basic dilemma is one of autonomy versus integration. Professional engineers or scientists must be given sufficient autonomy to enable them to fulfil their professional needs, yet at the same time their activities must be seen to contribute to the overall goals of the organisation. Thus, for example, technologists may desire to involve themselves in projects because of their fundamental technical or scientific merit, whereas the primary concern of the organisation is with product

marketability. Even where scientists are allowed to pursue more basic research, problems arise, because the low priority given to such work by the organisation means that it is always vulnerable to termination when times are hard or business needs become more pressing. Thus conflicts can arise over which projects are to be tackled, how they are to be tackled, and how much time is spent on them.

Because of his/her cosmopolitan orientation, the loyalty of the scientist or engineer is primarily to his/her profession or field of speciality, rather than to his/her organisation (Cooper & Marshal, 1980). Thus he/she wishes to be judged by his/her professional contribution. This often involves making his/her knowledge public, which leads to further tensions since the economic aims of the organisation often dictate that information be withheld from possible competitors. If technologists wish to be judged by their fellow professionals on the basis of their scientific or technical achievements, it seems reasonable to assume that they would feel that their career progression should also be on this basis. However, in terms of the goals of the organisation, career progression is more likely to be based on the contribution made to commercial success than to technical accomplishments per se. If these theoretical speculations are accurate, then there seems little doubt that conflicts between professional and organisational goals constitute a stressful situation for many technologists. What available evidence is there to support or refute these views? Freudemberger (1974) studied research chemists working in industrial laboratories and found evidence of strains arising out of conflicts between the professional values of the scientists and the goals of the organisation. These chemists also complained of having insufficient opportunity to utilise their research skills and a number experienced that their creativity was hampered in their jobs.

According to Etzion, Kafry and Pines (1982), the major strategies for dealing with burnout consist of:

- (a) being aware of the problem;
- (b) taking responsibility for doing something about it;
- (c) achieving some degree of cognitive clarity; and
- (d) developing new tools for coping, improving the range and quality of old tools.

These four strategies will now be discussed.

2.1.6.1 Awareness

Adequate coping consists first of awareness of the fact that there is a problem. There are people who hide from the problem and try to avoid thinking about it. These are people who believe that the way things are is the way they have to be; they also believe that the way things are in this job is the way they are in all jobs. "That's life" is a slogan that may reduce pain slightly, but it also prevents finding a solution. This generalised cynicism, masquerading as a philosophical outlook, makes it impossible for people to develop a special awareness of what is happening to them.

Other people who are somewhat aware of the problem tend to think that it is their own entire fault. This is usually only partial awareness and it is almost always misdirected and, therefore, dysfunctional. Becoming fully aware of the problem includes becoming aware of the locus of the cause. Awareness temporarily increases the pain until action is taken.

To summarise, one part of achieving awareness is the simple realisation that there is a problem; the other part is the awareness that the problem is largely a function of the situation rather than a function of one's own dispositional inadequacy.

2.1.6.2 Taking responsibility for action

Once a person becomes aware that the problem is largely situational, then the coping strategies shift from: What's wrong with me as a person? What can I do about changing my environment to make it more pleasant and facilitative for me to accomplish my personal and professional goals?. But in order to effect a change, a person must be willing to take responsibility for changing the environment. This is usually a difficult stage. While many are willing to take responsibility for something that seems to be their fault, they are reluctant to do something about situational or institutional problems. Somehow if it is a situational problem, the organisation should deal with it. This is not an unreasonable wish – unfortunately one cannot count on an organisation to take remedial action. Occasionally an extremely enlightened organisation might accomplish this task, but this is a rare exception. People can assume more power and control over their lives through the realisation that there are more things that they can do to gain control over the environment than they realise.

2.1.6.3 Cognitive clarity

When people are aware of the existence of a problem and are ready to take responsibility, the third thing necessary is cognitive clarity. When people are burned out and working in a bureaucratic organisation, they usually cannot easily discriminate the things that can be changed from the things that cannot be changed. Burnout often manifests itself in people who assume that everything destructive and dehumanising can be changed. These people invariably end up banging their heads against the stone wall of a non-responsive bureaucracy. It could be easier to accept that some aspects of a bureaucracy simply cannot be changed. After trying and failing, they obviously begin feeling hopeless and helpless and come to believe that

nothing can be changed from the outset. These individuals quickly develop a cynical attitude and never attempt to change anything.

But there are many aspects of a difficult work situation that can be changed with little effort. Part of what we mean by the achievement of cognitive clarity is the development of an ability to distinguish between those aspects of an organisation that cannot be changed and those that can. This allows individuals to channel their efforts where there will be a great likelihood of important progress. Not only will the change itself be beneficial, but the mere process of being able to effect a change will reduce the feeling of helplessness and hopelessness and thereby reduce burnout even though the situation remains far from ideal.

There are also other discriminations to be learned: for example, people must learn to discriminate between the concrete demands of the job and the demands they place on themselves that they sometimes erroneously attribute to their “supervisor” or their organisation. Thus, some people regularly overwork, assuming that this is a demand placed on them by their organisation. But if they examined that presupposition closely, they would realise that they were much harsher taskmasters than their employer. They would then realise that they did have more control than they thought – and would have to deal with the issue of whether or not they wanted to exercise that control.

2.1.6.4 Developing tools for coping

Some of the major tools necessary for coping have already been alluded to. For example, in order to see the specific problem, one needs to develop some diagnostic and discrimination skills. An individual needs practice in looking inward so as to be able to articulate clearly what his/her own needs are in a given situation. If a solution involves meeting with other people to

discuss problems and solutions, certain skills such as “active listening” and clear communication need to be developed. It is important to realise that these skills are, at one and the same time, essential and relatively easy to master.

2.2 COPING STRATEGIES

2.2.1 History and background of the study of coping

Stress has been a major topic in psychological research since the work of Selye in the 1950s (Costa, Somerfield & McCrae, 1996). Researchers have also been interested in how people adapt to adverse circumstances. How people cope with chronic or acute stressful problems and how their coping efforts affect them have been among the major issues considered by psychologists. Research on coping became popular only in the 1980's after groundbreaking publications by Moos (1976), Pearlin and Schooler (1978), Folkman and Lazarus (1980). The study of coping and adaptation has rarely been divorced from the study of individual differences. However, some scholars have advocated a sharp separation between personality and how people manage, reduce, or avoid upsetting problems. This lack of consensus reflects the long and chequered history of dispositional models in psychological theory and research.

A careful examination of the history of the study of coping, carried out by Lazarus and Folkman (1984), shows that it has been viewed successively as almost synonymous with, completely distinct from or as overlapping with personality traits. According to them, research on coping has passed through two generations and is now entering an exciting third phase. The first generation, at the beginning of the century, was represented by the psychoanalysts. The second generation began in the 1960's and evolved through the 1970's and 1980's. This generation is strongly associated with the work of Richard Lazarus and his associates (Folkman & Lazarus, 1980; Lazarus,

1966; Lazarus & Folkman, 1984). Others also contributed significantly to the work of this generation (Meichenbaum, 1977; Moos, 1977; Taylor, 1989). Recently, a third generation has appeared, which represents the convergence of personality and coping (e.g. O'Brien & DeLongis, 1996; Watson & Hubbard, 1996).

According to the comprehensive models of stress and, more specifically, occupational stress, coping is a buffer factor. In other words it mediates the relationship between job stressors and stress outcome, or between antecedent stressful events and negative outcomes (Endler & Parker, 1990). Amirkhan (1990) suggested that knowledge and understanding of external stressors is not as important, in terms of stress outcome, as an understanding of how a person appraises and copes with those stressors. Harrison (1983, p. 14) understood coping as "encompassing a broad range of behavioural, emotional and cognitive efforts which are initiated in an attempt to avoid the possibility of disturbances in physical, social and emotional functioning, following exposure to life-strains or potentially stressful situations".

2.2.2 Definition of coping

Coping is defined by Lazarus and Launier (1978, p. 311) as "the efforts, both action-oriented and intrapsychic, to manage (that is, to master, tolerate, reduce, minimize) environmental and internal demands and conflicts among them which tax or exceed a person's resource".

Lazarus and Folkman (1984, p. 141) similarly defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and / or internal demands that are appraised as taxing or exceeding the resources of the person".

Lazarus and Folkman (1984) therefore define coping in terms of problem-focused strategies and emotion-focused strategies (Lazarus & Launier, 1978). Problem-focused strategies include cognitive and behavioural strategies to deal with the stressor or stressful situation itself, and emotion-focused strategies deal with the inherent negative emotions or distress. Amirkhan (1990) states that this definition or distinction avoids the problematic confounding of coping with outcome, since it focuses on efforts to manage the stress, whether or not they are successful. This view is supported in the present research.

2.2.3 The development of coping

Carver et al. (1989, p. 281) discuss individual differences in coping. One view states that people have fairly stable coping preferences and that these preferences are possibly a function of personality. They write that “the personality traits of optimism, locus of control, neuroticism, and extroversion have all been linked to situational coping activities in one or other study”.

Folkman and Lazarus (1980) considered some approaches to the conceptualisation of coping and commented on each of these in terms of the implications for accelerating the coping process. One of these is the personality-based approach. Such models would assume that individuals all have unique and unchanging ways in which they deal with life problems. The implications of personality-based approaches to coping are, firstly, that individuals’ ways of coping with stressors are unchangeable, and secondly, that as a result, the coping process is not really able to be accelerated.

Harrison (1983) pointed out that Lazarus, along with various colleagues (Folkman & Lazarus, 1980; Lazarus, 1966; Lazarus, Averill & Opton, 1974), has provided researchers with one of the most comprehensive models of coping, which does accommodate the possibility of accelerating the coping

process. It is based on the cognitive phenomenological theory of stress (Harrison, 1983) and focuses on a framework which is transactional. The model stresses a flexible, process-centred approach to coping, where it is seen to be responsive to contextual variations and “feedback from the flow of events which affect adaptational outcome” (p.18). The conceptualisation put forward by Lazarus and his colleagues defined appraisal and coping as the two primary cognitive processes in the stress system. The relationship between appraisal and coping is such that the two processes influence each other in a dynamic and interdependent way. In other words a person’s perception and evaluation of a stressor influences his / her way of coping, which in turn influences one’s perception of the stressor.

2.2.3.1 Problem-focused versus Emotion-focused strategies

As noted above, Lazarus and Folkman (1984) define coping in terms of problem-focused strategies and emotion-focused strategies (Lazarus & Launier, 1978). The former included cognitive and behavioural strategies to deal with the stressor or stressful situation itself, and the latter to deal with the inherent negative emotions or distress. Amirkhan (1990) stated that this definition or distinction avoids the problematic confounding of coping with outcome, since it focuses on efforts to manage the stress whether or not they are successful. Regelson (1989) based his research on a similar distinction and consequently states that “coping is behaviour directed towards the resolution or mitigation of a problem, with the aim of changing the situation or its perceived implications, or of combating the negative emotions generated” (p. 394).

2.2.3.2 Situational and Personality Variables

Folkman and Lazarus (1984) also gave particular attention to the factors that contribute to variability in coping behaviours (Harrison, 1983). Lazarus et al.

(1974) defined two groups of determinants of coping behaviour: They are situational and personality variables. Steptoe (1991) stated that “coping responses arise through an interaction between situational factors and personal predispositions or habits” (p. 208). Harrison (1983) cited as possible situational factors, the type, intensity and duration of stimulus or situational demand. Furthermore, he suggested that situational and personal factors determine whether a person tends to use emotion-focused or problem-focused strategies. For example in the case of terminal illness, regardless of the individual’s personality, he/she will have little or no access to effective problem-focused coping strategies and will be forced to cope in terms of emotion-focused strategies.

Personality variables or dispositions, on the other hand, are said to be significant in determining coping behaviour to the extent that they “provide orientations towards stimulus objects” (Harrison, 1983, p. 20). The suggestion is that personality impacts upon the perception and appraisal of potential stressors which, in turn, impacts upon coping. Personality also determines the nature and range of coping mechanisms which are at the disposal of the individual in a given situation.

2.2.3.3 Pearlin and Schooler’s perspective

Pearlin and Schooler’s (1978) model of coping represented a reaction against the emphasis in the literature on “highly individualised intra-psychic methods of coping with stressful events” (Harrison, 1983, p. 20). The emphasis of their research is consequently on the chronic and commonly experienced life stressors that are a function of social roles. On the whole, Pearlin and Schooler’s (1978) model suggests that coping is a multidimensional phenomenon, and that “different kinds of coping mechanisms are effective in different problem areas and that coping flexibility is an important prerequisite for effective coping” (Harrison, 1983, p. 23). Nevertheless they

acknowledge that people probably do develop modal coping styles which remain fairly constant over situational boundaries. The point which they make, however, which appears to be neglected in the other literature, is that “social structural conditions may influence the development of certain coping repertoires” (Harrison, 1983, p. 23).

Below the three generations of research into coping are discussed, namely the psychodynamic perspective, the transactional perspective and the third generation that deals with the convergence of personality and coping.

2.2.3.4 The Psychodynamic perspective (the first generation)

Formal interest in adaptational processes dates back to the 19th century. The concept of defence was popularised as a set of psychological mechanisms by which individuals distort reality to manage distressing feelings, particularly anxiety (Costa, Somerfield & McCrae, 1996). To him, personality represented the pattern of coping mechanisms that allowed the individual to hold libidinous urges at bay (Costa, Zonderman & McCrae, 1991; Endler & Parker, 1990). Lazarus (1977, p. 1) defined personality in terms of coping and defending as “the fundamental and persistent organisational strategies that people use to interregulate various aspects of themselves”.

Defensive processes are, by definition, unconscious and have thus proven extraordinarily difficult to access reliably and validly. In the 1950s and 1960s, defence mechanisms and the very concept of the unconscious fell out of favour among academic psychologists in the interests of enhancing the scientific credibility of psychology and in keeping with the basic tenets of radical behaviourism and logical positivism (Lazarus, 1998).

2.2.3.5 The Transactional perspective (the second generation)

Although the psychodynamic approach has continued to have its adherents, it has gradually been replaced as the dominant paradigm in the adaptational literature. This shift occurred partly because researchers became less inclined to view adaptational mechanisms in the context of psychopathology, but preferred instead to conceptualise them as normal, healthy processes that enable individuals to solve the ongoing problems in their lives. In a related vein, adaptational mechanisms were increasingly seen as being rational and under conscious control, rather than being involuntary and unconscious (Costa et al., 1996).

The new perspective on coping that replaced the psychodynamic perspective emerged in the 1960s and increased its momentum in the next two decades. This new approach, which emphasized processes more than structures (or dispositions), was captured in the work of Lazarus and Launier (1978), Moos (1977) and Meichenbaum (1977). Lazarus and his colleagues, however, are most strongly identified as the promulgators of the new perspective in terms of both their conceptual and their empirical contributions (Folkman & Lazarus, 1980; Lazarus, 1966; Lazarus & Folkman, 1984).

This model no longer describes stress as something that occurs in a kind of stimulus-response manner. Rather, researchers view the stress response as the result of a transaction or interaction between environmental demands and the person's appraisal of these demands and personal resources (Cox, 1978; Coyne & Lazarus, 1980; Lazarus, 1966; Mason, 1975). The concept of cognitive appraisal is central to this type of model (Cox, 1990), and is often closely linked to that of coping.

In cognitive appraisal, the person evaluates whether a particular encounter with the environment is relevant to one's well-being, using two types of appraisal, primary and secondary. In primary appraisal, the person evaluates whether the encounter is irrelevant, benign-positive, or stressful. If the encounter is evaluated as stressful, secondary appraisal is used to determine what coping options and resources are available, given the particular situation that is being encountered and the degree to which the situation could be changed (Thornton, 1992). Thus, whether the person experiences an event as stressful or not depends upon the meaning he/she assigns to the experience. Whether the danger is real or imagined, the body's reaction to the stressor is the same (Maslach, Jackson & Leiter, 1996).

Further, as a result of an ongoing transaction with their environment, individuals are confronted with demands that impinge on their cognitive processes and which challenge their ability to cope or adapt (Parkes, 1984). Something must be at stake in a situation for it to give rise to stress (Cox, 1978), and there must be awareness that there is some deviation from normal functioning (Parkes, 1984). The key to the process of cognitive appraisal according to Lazarus (1966), is the evaluation that individual well-being is threatened, challenged or harmed in some way (Lazarus, 1976). Such an appraisal is associated with a desire for resolution, which it provides the motivation and direction for coping.

Lazarus and Folkman (1984, p. 141) described coping as constantly changing cognitive and behavioural efforts to manage specific external and / or internal demands that are appraised as taxing or exceeding the resources of the person. There are two major coping strategies. *Problem-focused* coping includes strategies focused on dealing with the stressor itself. In some situations one might gather information about a problem and formulate a plan of action in order to alter or eliminate the stressor. *Emotion-focused* coping refers to efforts to deal with one's emotional response to a stressor.

For example, redefining a situation in order to see it differently has been viewed as a strategy aimed at reducing emotional distress (Folkman & Lazarus, 1980; Lazarus, 1966; Lazarus & Folkman, 1984).

Another contribution of Lazarus and Folkman (1984, p. 283) is the important distinction between coping and adaptation. According to them “there is an emerging consensus that ‘coping’ and ‘adaptation’ should be distinguished. Adaptation is a broader concept that includes routine, even automatic, modes of getting along, whereas coping always involves some sort of stress”.

2.2.3.6 Personality and coping (the third generation)

The work of Lazarus and Folkman (1984) was extremely influential, leading research regarding coping into a new era in which relatively little attention was given to dispositional concepts. However, it is apparent that the field has again changed course, in such a way that trait constructs now constitute the focus of renewed interest. Much of this resurgence can be attributed to the fact that 20 years of research into coping has yielded findings that frequently are described as puzzling, paradoxical, or disappointing (Costa & McCrae, 1989; Costa et al., 1996).

According to Watson and Hubbard (1996), the process-oriented paradigm of the 1970's and early 1980's was as limited as the psychodynamic approach that preceded it. The accumulating body of evidence indicated that situational factors do not explain all of the variations in coping (Lazarus & Folkman, 1984). Recent evidence suggests that both situations and personality explain significant amounts of variations in coping behaviour (Parkes, 1986), despite the fact that Lazarus maintained that dispositional factors are too broad to be useful in the prediction of coping outcomes. Other researchers disagreed with him. Kohn (1985) accused Lazarus of underestimating the role of personality dispositions in the stress experience,

and Costa and McCrae (1990) also criticised Lazarus for failing to acknowledge clearly enough the importance of personality traits in his models of stress and coping. They refer to enduring personality dispositions as “hidden factors” that greatly affect the relationship between potentially stressful events and resulting stress symptoms.

According to Watson and Hubbard (1996), there are three dispositional approaches in coping research.

First, coping styles themselves can be dispositional tendencies. It is well established that coping strategies exhibit the classic properties of all traits. That is, individual differences in the tendency to use particular coping styles (e.g. seeking social support, escapism) are both moderately stable over time (Carver et al., 1989; McCrae, 1989) and reasonably consistent across different contexts and classes of events (Costa et al., 1996).

Second, researchers have investigated how coping strategies are related to specific personality traits. Among the traits that have been widely studied are optimism (Carver et al., 1989; Parkes, 1994; Scheier, Carver & Bridges, 1994), hardiness (Carver et al., 1989; Parkes, 1994; Wiebe & Williams, 1992; Williams, Wiebe & Smith, 1992), self-esteem (Carver et al., 1989; Pearlin & Schooler, 1978, Scheier et al., 1994) and locus of control (Carver et al., 1989; Parkes, 1984; 1994).

The third approach is one that has been relatively understudied in the coping literature. This approach attempts to place coping in the context of a general structural model of personality traits – the so-called Big Five (Goldberg, 1993; McCrae & Costa, 1978). Perhaps the most important feature of the third generation researchers is that they acknowledge the importance of both situational and individual determinants of coping.

2.2.4 The characteristics of coping

Despite many years of theory and research and the development of a variety of self-report coping instruments, researchers still do not have a comprehensive understanding of the characteristics of coping. Therefore, the structure and consistency of coping will now be discussed, as well as the confounding of coping and outcomes such as depression and anxiety, and the difference between coping choices and coping effectiveness.

2.2.4.1 The structure of coping

Theorists differ widely in the number of coping mechanisms they propose, from global dichotomies (Folkman & Lazarus, 1980) to lengthy lists of coping and defence mechanisms (e.g. Lazarus, 1977). As mentioned above, Lazarus and his colleagues have hypothesised that primary coping strategies can be organised best into two higher-order categories: *problem-focused* strategies and *emotion-focused* strategies (Folkman & Lazarus, 1980; Folkman & Lazarus, 1984).

More detailed taxonomies of coping also exist. Marshall and Dunkel-Schetter (1978) reviewed factor-analytical studies of the most widely-used coping measure, the Ways of Coping Inventory (Folkman & Lazarus, 1980). These authors identified six main types of coping: problem-focused coping, seeking support, focusing on the positive (i.e. reappraising the situation in a positive way), distancing (i.e. minimising threat by becoming psychologically detached from the stressful situation), wishful thinking (i.e. engaging in fantasies about escaping or avoiding the situation), and self-blame.

Folkman and Lazarus (1980) also found seven factors that provided a better fit for the data upon which the Folkman and Lazarus (1980) article was based (see Ben-Sira, 1985). The seven coping factors were: problem-focused,

employing wishful thinking, aiming at growth, minimising threat, seeking social support, blaming self, and a mixed scale containing both avoidance and help-seeking strategies.

One trend has been the development of coping scales with fewer but broader dimensions. Two examples of this are the Multidimensional Coping Inventory (MCI) (Endler & Parker, 1990) and the Coping Strategy Indicator (CSI) (Amirkhan, 1990). The MCI assesses task-, emotion-, and avoidance-oriented coping strategies, whereas the CSI taps into problem solving, seeking social support and avoidance.

The COPE inventory (Carver et al., 1989) is a notable exception to the trend of examining fewer and broader coping strategies. The COPE assesses 13 strategies, and Carver et al. (1989) asserted that most other measures do not sample all of the specific domains of coping that are of theoretical interest. They argue that each broad type of coping (e.g. emotion-focused coping) may involve several distinct strategies (e.g. denial, reinterpretation, seeking social support), each possibly having very different implications for adjustment (Carver et al., 1989). One could still argue, however, in favour of even fewer dimensions because a number of the scales are inter-correlated. For example, active coping, planning, and seeking instrumental social support are inter-correlated in Carver et al.'s instrument, as are denial, behavioural disengagement, and mental disengagement (Carver et al., 1989).

2.2.5 The symptoms of coping

Caplan (1964) suggested that coping strategies are effective to the extent that they meet certain criteria. Caplan identified eight characteristics of effective coping behaviour that apply to different kinds of life crises:

(a) Being aware of the problem.

- (b) There is an active exploration of reality issues and a search for information.
- (c) There is a free expression of positive and negative feelings and a tolerance of frustration.
- (d) There is an active effort to engage the help of others.
- (e) Problems are broken down into manageable bits and worked through one at a time.
- (f) There is an awareness of fatigue and disorganisation, a pacing of oneself, and the maintenance of control in as many areas of functioning as possible.
- (g) Feelings are mastered where possible, and where mastered, the inevitable is accepted.
- (h) There is a fundamental trust in oneself and others and a sense of optimism that something can be done to bring about a positive outcome.

Lazarus (1974) suggested two general strategies for coping, namely (a) direct action, in which the person tries to master the stressful transaction with the environment; and (b) palliation, in which the person attempts to reduce the disturbance when unable to manage the environment or when action is too costly for the individual. Direct coping, or direct action, is a strategy applied externally to the environmental source of stress, and indirect coping, or palliation, is a strategy applied internally to one's behaviours and emotions.

Pines and Aronson (1988) state that in addition to the direct / indirect dimensions of coping, they found an inactive / active dimension. An active coping strategy involves confronting or attempting to change the source of stress or oneself, whereas an inactive coping strategy involves avoidance or denial of the stress by cognitive or physical means. These two dimensions, direct / indirect and active / inactive, generate four types of coping strategies, each of them represented by certain kinds of behaviour. Those mentioned below are, of course, not the whole spectrum of behaviour, but

an indication of the type of coping behaviour observed by Pines and Aronson (1988).

(a) Direct-active: changing the source of stress, confronting the source of stress, finding positive aspects in the situation, etc.

(b) Direct-inactive: ignoring the source of stress, avoiding the source of stress, leaving the stressful situation, etc.

(c) Indirect-active: talking about the stress, changing oneself to adapt to the source of stress, getting involved in other activities, exercise, etc.

(d) Indirect-inactive: drinking or using drugs, getting ill, collapsing, etc.

From the above it seems that the interaction of individuals with their unique situations is the ultimate measure of appropriate coping behaviour because each one deals with stressful situations in his/her individual way. Support was found in the literature for a relationship between burnout and personality variances in nurses (Muldary, 1983). The theoretical attempt to systematise and prescribe strategies for coping should be recognised as such, and is not a denial of the reality of the unique individual experience of life and stress.

Social systems do not exist solely to make demands on the individual. Social systems can also be a source of some of the very important rewards that individuals need. One of the main rewards provided by people is social support. Social support is defined by Morano (1993, p. 396) as "networks of occupational relationships, which shall comprise one or more of the following: affect or emotional support (admiration, respect, liking), affirmation or appraisal (acknowledgment of the appropriate behavior of another), and aid (direct giving of materials, information or service)". Social support is not only found in occupational relationships. Muldary (1983) stated that most people have at least one support group, and often that group is the person's family.

According to Pines and Aronson (1988, pp. 160 – 165), social support systems serve a multitude of functions which can be organised into six basic categories, namely:

- (a) Everyone has occasions when he or she needs one or more people who will actively listen to him or her, without giving advice or making judgments.
- (b) All individuals need technical appreciation for the work they do; when they do a good piece of work, they need to have it acknowledged.
- (c) It is comforting to be in an environment where you are the expert and no one challenges that expertise, but if individuals are not technically challenged they run the risk of stagnation and boredom. Technical challenges force individuals to develop new ways of doing the job and this enhances growth.
- (d) Another important function of an effective support system is emotional support or appreciation, even if the supporters are not in total agreement with the person receiving the support. The supporters care about the individual as a human being, win or lose.
- (e) Emotional challenge is different from technical challenge. Friends do not have to be experts in one's field, they merely have to say, "Are you sure you are doing enough?" Needless to say, trust is a prerequisite for this function.
- (f) The sixth function is that of social reality testing and sharing, or a social reality touchstone. Social reality is vague, a friend can help the individual interpret this reality and decide on reasonable action.

When individuals encounter people in their environment who fulfil all these functions they are well protected against burnout and go a long way toward reducing stress in life and work. It is important to distinguish one function from another. Social support is not a global thing, but rather a number of separate functions. The fact that one human being recognises the other person's identity, values that person, and sometimes actually helps him/her constitutes social support (Muldary, 1983).

2.2.6 The application of coping

In terms of coping success, it is likely that people will cope better when they are able to access coping strategies which are comfortable and familiar. Furthermore, coping success depends on the degree of fit between a preferred coping strategy and situational constraints (Carver et al., 1989).

In terms of the effectiveness of the various strategies, Clark and Watson (1995) state that there is no significant agreement as to which are most effective in the mediation of stress, in terms of emotional relief, problem solving and health outcome. Bandura (1989) states that “problem- and emotion-focused coping mechanisms are both useful under the appropriate circumstances in facilitating adjustment to stressors” (p. 389). There have been studies which have suggested that problem-focused strategies decrease emotional distress and that emotion-focused strategies increase it, while other studies have demonstrated exactly the opposite. These authors point out that factors which may influence the relationship between coping and mental health outcomes include the type of problem faced and the “degree of stress experienced” (p. 338). Clark and Watson (1995) go on to discuss the results of their own study. A very important finding was that the causal relationship between coping and mental health outcome seemed to be bidirectional. The explanation for this was that people who have poorer initial mental health may be vulnerable to more frequent stressful life events. Furthermore, they may be prone to using more maladaptive coping mechanisms, and so “a mutually reinforcing cycle between poor mental health and maladaptive coping strategies” (p. 343) is perpetuated. Although in their study the independent variable is mental health, as opposed to burnout, the cyclic explanation holds true as a possibility and is congruent with the transactional models of stress reviewed earlier in this study. The point is that the higher the initial degree of emotional distress and the greater the intensity of the problem, the more likely people are to use maladaptive coping, further

increasing emotional distress and possibly increasing the probability of problems in the future (Bauman & Udry, 1972).

According to Schaufeli et al. (1993) the organisational environment is essential in understanding and coping with burnout because burnout is defined as a negative, work-related psychological phenomenon. There are several avenues open for organisations committed to the improvement of the quality of the work experience for workers.

Cox (1990) observed that it is generally assumed that the quality of the organisation, of the work environment, and of work itself can affect the experience of stress and employee health and work performance. That is, the healthiness of the organisation may affect the health and performance of its employees. It is the study of this interaction between the healthiness of the organisation and health within the organisation that Cox termed "organisational health" (Cox, 1988). The fact of this interaction offers a chance of promoting occupational health through organisational development.

2.3 SENSE OF COHERENCE

2.3.1 History and background of sense of coherence

After 1970 Antonovsky (1979) became aware of and formulated the salutogenic question. In answer to the salutogenic question Antonovsky (1987) developed the sense of coherence concept and he then stated that he was "quite persuaded, until data compel me to modify or change my position, that the sense of coherence was a very major determinant of maintaining one's position on the health ease / disease continuum and of movement toward the healthy end" (p. 15). Up to the time of his death in

1994 Antonovsky was never persuaded to alter his position on this concept drastically.

The sense of coherence (SOC) differs from many other coping constructs by focusing on those factors which promote coping and well-being, rather than focusing on risk factors contributing to disease. The SOC focus is on the different factors which move individuals towards the healthy end of the sickness / health continuum. Thus, the SOC takes a “salutogenic” or health-oriented approach to coping.

Antonovsky (1987) sees comprehensibility, manageability, and meaningfulness as the three core components of the SOC. When individuals rate high on these components, they can be identified as having a strong SOC, and when they rate low on these three components they can be identified as having a weak SOC. Antonovsky is very adamant about the fact that a strong SOC is not a particular coping style. The stresses encountered in life are many and varied, and there are many possible coping procedures. To consistently adopt only one pattern of coping is to fail to respond to the nature of the stressor and therefore to decrease the chances of successful coping. What the person with a strong SOC does is to select the particular coping strategy that seems most appropriate to deal with the stressor being confronted.

Salutogenesis as developed by Antonovsky (1979), as a metaconcept in the study of health and coping includes a number of independent constructs that can be traced through the literature. Allport (1955) has, for example, studied the concept “proprie striving”; Antonovsky (1979, 1987) has studied the concept “sense of coherence”; Bandura (1982, 1989) and O’Leary (1985), among others, have studied “self-efficacy”; Bauman and Udry (1972) “powerlessness”; Ben-Sira (1985) “potency”; Cohen (1980) “predictability”; Colerick (1985) “stamina”; de Charms (1968) “personal causation”; Frankl

(1959) "freedom of will, will to meaning, and meaning of life"; Fromm (1947) "productive orientation"; James (1911) "strenuousness"; Kobasa (1982) "hardiness"; Kohn and Schooler (1983) "self-directedness"; Libassi and Maluccio (1986) and White (1959) earlier, "competence"; Pearlin and his colleagues (1981) "mastery"; Rosenbaum (1988) "learned resourcefulness"; Rotter (1975) "locus of control"; Senge (1990) "personal mastery"; and Werner and Smith (1982) "invincibility".

Antonovsky (1979) argued that at any time at least one third or more of the population of any industrial society is characterised by some morbid pathological condition. For Antonovsky (1979, p 77) this pathological condition is the "unbelievable hell on earth of so large a part of the world's population". He stated further that illness is not a rare deviance but is the normal state of the human condition. "Given the ubiquity of pathogens – microbiological, chemical, physical, psychological, social, and cultural – it seems to me self-evident that everyone should succumb to this bombardment and constantly be dying" (1979, p. 13). Since this is clearly not the case, the salutogenic concept "poses a radically different question, which is: why are people located toward the positive end of the health ease/dis-ease continuum, or why do they move toward this end whatever their location at any given time?" (Antonovsky, 1987, p. 12). Stated differently, the salutogenic concept focuses on the unravelling of the mystery of health and is an attempt to address how people manage stress and stay well.

2.3.2 Definition of sense of coherence

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

- (a) the stimuli deriving from one's internal and external environments in the course of living are structured, predictable, and explicable;
- (b) the resources are available to one to meet the demands posed by these stimuli; and
- (c) these demands are challenges, worthy of investment and engagement".

Antonovsky (1987) (quoting Galdston, 1954, p. 13 and himself, Antonovsky, 1985, p. 275) uses a metaphor to convey the flavour of the salutogenic image of life: "... a man walking a tightrope from one end to the other, balancing himself even while he changes clothes and takes on and discards a variety of other objects" (p. 89). "We begin to lose our balance and recover it; or slip, catch the rope, and return to a standing position; or fall into a net and again regain the rope; or fall, hurt ourselves acutely or are damaged chronically; or we are destroyed. Some complete the course, with ups and downs, but successfully – and what a glorious, exhilarating experience it has been" (p. 89).

According to Onega (1991) Antonovsky remarked that salutogenesis is defined as the study of why and how people stay well. Staying well has to do with how individuals manage tension. Tension is defined as an individual's response to stressors. If tension is managed appropriately, salutogenesis is enhanced. Antonovsky (1995) states that the salutogenic paradigm enjoins people to confront the question of the origins of health, the movements toward the health end of what he calls the health ease/dis-ease continuum. "Salutogenesis focuses on strengths, on the mystery of the movement toward health" (p. 6). For Strümpher (1995) the term fortigenesis (from Latin: fortis = strong and Greek: genesis = origins) seems to be more descriptive of the field of study than the term salutogenesis. Strümpher (1995) is of the opinion that introducing this construct is not a denial of the need to search for the origins of health; he argues that salutogenesis would be better served if called

fortigenesis because the focus is more on the enhancement of strength in the individual in general than on the why's and how's of staying well.

Taking all of the above into consideration, the following definition of salutogenesis is adopted for this research: Salutogenesis refers to the study of the strength individuals exhibit in order to manage the tension and stress in their lives and not succumb to illness.

2.3.3 The development of the construct of sense of coherence

The reason for the conceptualisation of salutogenesis was to counterbalance the pathogenic orientation of psychology. It is difficult to discuss the concept salutogenesis without mentioning pathogenesis, as salutogenesis was conceptualised to counterbalance the concept pathogenesis (Antonovsky, 1995). "Conventional models of medicine concentrate on individual pathology and generally operate through individually focused methods of prevention and treatment" (Handy, 1990, p 17). In the same manner psychology (Strümpher, 1990) has been functioning mainly in terms of a paradigm of pathogenic thinking. "The pathogenic orientation is directed, generally, at finding out why people fall ill and, in the specific, as they develop particular disease entities. Such understanding is then used to find ways of combating and preventing each of the diseases in turn" (p 266).

At the heart of the pathogenic paradigm is one assumption and concept. In the first place there is the assumption that diseases are caused by physical, biochemical, micro-biological and psychosocial agents, and here the emphasis is on multifactorial determination, usually in terms of risk factors. In the second place, there is Cannon's concept of homeostasis, which implies that the normal state of the human organism is a relatively constant condition (Strümpher, 1990). Homeostasis may, however, be disrupted by pathogens and stressors and if the regulatory mechanisms do not function adequately,

disease sets in (Strümpher, 1990). The pathogenic concept, of which the salutogenic concept is the opposite, is therefore in general a positivist theoretical paradigm that provides few insights into the experiential world of those it studies (Handy, 1990).

According to Strümpher (1995) the main thrust of salutogenesis and of Antonovsky's writings concerns sources of health. The salutogenic paradigm, and one can speak of the total concept/thought/idea of salutogenesis as a paradigm (Breed, 1988), thus moves away from the positivist theoretical paradigm, that permeates the rest of psychology, in three areas: Firstly, unlike the mechanistic model of human behaviour where human beings are dealt with as unconscious and reactive objects operating within a mechanistic and unchanging environment, human beings are regarded as proactive, self-aware subjects, intentionally intervening within a socially constructed world. Secondly, salutogenesis assumes that society is mutable and that human subjectivity and action may alter concomitantly, in contrast to the universal laws of the natural sciences. Thirdly, importance is placed on the social context within which an individual functions. This means that human behaviour is predominantly governed by the social rules which people generate to understand their world, instead of being an oversimplification of a limited range of proximal variables which are easier to measure and control (Handy, 1990).

2.3.4 The characteristics of sense of coherence

As noted earlier, Antonovsky (1987) sees comprehensibility, manageability, and meaningfulness as the three core components of sense of coherence (SOC).

2.3.4.1 Comprehensibility

Consistent experiences provide the basis for the comprehensibility component. Comprehensibility refers to the extent to which one perceives the stimuli that confront one, deriving from the internal and external environments, as making cognitive sense - as information that is ordered, consistent, clear and structured - rather than as nonsense or as information that is chaotic, disordered, accidental, inexplicable and random (Antonovsky, 1987; Strümpher, 1990). It also implies that on the basis of past experience stimuli will in future also be ordered and even be predictable. It means that perceptions make cognitive sense (Strümpher, 1990). The person rated high on the sense of comprehensibility expects that stimuli encountered in future will be more or less predictable, and even if they are not, that they will be orderable and explicable. Nothing is implied about the desirability of stimuli. Accidents happen and terrible things can happen, but a person rated high on comprehensibility can make sense of them (Antonovsky, 1979). The distinction between scoring low and high on comprehensibility is that in the case of the former the individual believes that things happen, invariably unfortunate things, and that this will probably continue to happen for the rest of the individual's life. In the latter instance, events in life are seen as experiences that can be coped with, challenges that can be met. At worst the event or its consequences are bearable.

2.3.4.2 Manageability

A good load balance, that is an underload - overload balance in life experience, provides the manageability component. Underload refers to a situation when there is not enough direction, or when the individual is seldom called on to exercise his/or her abilities or to actualise his or her potential. Overload refers to the individual setting a pace too rapid for the

development he/she demands, or never having enough time and energy to do everything, or not having enough resources to do something (Antonovsky, 1987). Manageability refers to the extent to which one perceives that the resources at one's disposal are adequate to meet the demands posed by the stimuli that bombard one. In other words, there is a load balance, and no underload or overload. According to Antonovsky (1987) "at one's disposal" may refer to resources under one's own control or to resources controlled by legitimate others, like friends, one's spouse, God, a political party, a doctor: anybody one feels one can count on and trust. A person who has a high sense of manageability will not feel victimised by events or feel that life is treating her or him unfairly. Bad things do happen in life, but when they do occur, the individual will be able to cope without endless complaints. Strümpher (1990) remarked that at this point the SOC construct interacts with the literature on social integration into various networks, as reviewed by Cohen (1988). A notable point made by the latter is that the mere perception that help is available may make things manageable, without actual help or support being provided.

2.3.4.3 Meaningfulness

Meaningfulness is the component that, for Antonovsky (1979), guards against too great an emphasis being placed on the cognitive aspect of the sense of coherence. Meaningfulness also refers to the importance for the individual of being involved in the process of shaping not only his or her destiny, but also his or her daily experience. Therefore, meaningfulness refers to the extent to which one feels that life makes sense emotionally. This means that at least some of the problems and demands posed by living are worth investing energy in or are worthy of commitment and engagement. This also means that some challenges are seen as welcome rather than as new burdens that one would much rather do without (Antonovsky, 1987). For any life

experience one can ask whether the individual has had a say in choosing to undergo that experience, in judging whether the rules of the game are legitimate, and in solving the problems and tasks posed by the experience. When others make decisions on behalf of the individual and he or she has no say in the matter, he or she is reduced to being an object. It is important to stress that the dimension is not control, but participation in shaping outcome, participation in decision making, taking responsibility.

Discussion

The sense of coherence within an individual's psychological functioning is characterised by the comprehension of stimuli stemming from the environment as clear, ordered and structured. The work environment is manageable regardless of the challenges posed by it, and work provides meaning to him or her. Successful task performance is concomitant with the intelligence, knowledge and skills the person brings to work. When the task is ambiguous and complex, the strength of the person's sense of coherence will determine the successful completion of the task. An internal locus of control enables the individual to function independently, set realistic goals for the future, yet be in contact with the here-and-now, whilst reflecting on past experiences to contribute to current decision-making. He or she is motivated by what he or she wants, prefers, likes and chooses. These individuals take responsibility for themselves and their performance at work. They are not afraid to make decisions for themselves in the work situation.

2.3.5 The symptoms of sense of coherence

The question that needs to be answered is: how does a strong sense of coherence (SOC) manifest itself in the individual's life? What is becoming clear is that the sense of coherence refers to a generalised, long-lasting way

of seeing the world and the individual's life in it. A strong sense of coherence does not mean that the person views his or her entire world as comprehensible, manageable and meaningful. The individual sets boundaries, some wide, some narrow, and what happens outside these does not bother him or her. A strong sense of coherence does not mean the whole world has to be coherent: but even with narrow boundaries, the real world will still influence the individual. There are four spheres that cannot be excluded if a person is to maintain a strong sense of coherence, namely, the individual's feelings, immediate interpersonal relations, the major sphere of activity and the existential issues of death, inevitable failures, shortcomings, conflict and isolation (Strümpher, 1990). It may also well be that one of the most effective ways a person with a strong sense of coherence maintains his or her view of the world as coherent is to be flexible about the life areas included within the boundaries considered significant, and of course to be able to shift these boundaries as needed over time. In other words, a strong sense of coherence does not imply a rigid sense of coherence. "The strong-sense of coherence person seeks a balance between rules and strategies, between stored and potential information, there is confidence that sense can be made of the new information, there is little felt danger in seeing the world as a challenge and in being open to feedback" (Antonovsky, 1978, p. 27). This has implications for the intrapsychic and personal dimensions of an individual's life, as well as for the social and interpersonal aspects of his or her life.

Antonovsky (1987) is of the opinion that the failure to extend the definition of stressors to all stimuli that are taxing, whether or not they are appraised as endangering, underlies the widespread failure to distinguish between tension and stress and derives from a pathogenic orientation. In all cases the stimulus that reaches the brain is indeed defined initially as a stressor or non-stressor. To perceive a stressor as benign or irrelevant is to define it as of little consequence for one's life, to be able to assume that whether one mobilises

the resources to deal with the demand matters little; the tension will soon evaporate. It is in essence a cognitive re-framing of the stressor as a non-stressor.

Antonovsky (1978) states that this reframing is possible because the individual has confidence that, as in the past, by and large things will work out, that what seems to be a problem will turn out not to be much of a problem and to be reasonably soluble, that the dissonance is only apparent. This is in line with Bandura's (1982) self-efficacy theory. What is argued within this paradigm is that successful coping, which would ultimately lead to a more positive health outcome, is closely linked to the extent to which one is capable of cognitively and emotionally ordering one's perception of the stressor and accepting a willingness to confront it. In other words, one's construction of reality following a stimulus will determine the action or non-action taken to deal with the stimulus.

Finally Antonovsky (1987) states that the social category in which an individual finds himself/herself is decisive in determining the particular patterns of life experiences that engender a stronger or weaker SOC. Although culture, class, and history offer no ironclad guarantees of a pattern of life experiences of consistency, load balance and participation in decision making, they do allow for statistical prediction.

2.3.6 The application of sense of coherence

In a discussion of work experiences as a specific form of life experience, Sorokin (1959) proposed the premise that all the psychological processes of any member of an occupation undergo modification, especially when one stays in the same occupation for a long time. Even greater is the occupational influence on the processes and on the character of one's

evaluations, beliefs, practical judgments, opinions, ethics, and whole ideology. Antonovsky (1987) argues that this premise is too general to produce a detailed understanding of how one's job shapes one's sense of coherence or a positive health outcome. What is important is the question of the social valuation of the enterprise (the occupation) in which one is engaged. Such valuation is expressed in the resources (power, rewards, prestige) allocated by society to the collectivity. This is also valid for the individual worker. The more one perceives the social valuation of one's work as meeting one's criteria of equity, the more one is likely to feel that "this is mine". Kohn (1985) stated that there is accumulating evidence that job conditions affect adult personality mainly through a direct process of learning and generalisation: in other words that the lessons of the work are directly carried over to non-occupational realms. The above does not mean a generalisation to all people. Individuals live in a given sociophysical environment. Each of these implies a set of life experiences relevant to the health outcome of the individual.

Strûmpher (1990) states that it seems evident that the sense of coherence not only refers to how people stay healthy, but that it must impact on how work is approached and performed. It is hypothesised that a strong sense of coherence would thus result in the person (Strûmpher, 1990, p. 270):

- (a) Making cognitive sense of the workplace, perceiving its stimulation as clear, ordered, structured, consistent and predictable information;
- (b) Perceiving work as consisting of experiences that are bearable, with challenges that can be met by availing oneself of personal resources or resources under the control of legitimate others;
- (c) Making emotional and motivational sense of work demands, as welcome challenges, worthy of engaging in and investing energies in.

An individual with a strong sense of coherence seems to be an asset to any organisation. If a person has an orientation such as the one outlined above, then it tends to lead to productive performance, recognition, reward and promotion.

2.4 CHAPTER SUMMARY

The aim of chapter 2 was to provide a theoretical framework of the concepts burnout, coping and sense of coherence. The focus was on conceptualising each by presenting some history and background, finding applicable definitions, and focusing on the development, characteristics, symptoms and applications of these constructs. This concludes steps 1-3 of the literature review. Next, a theoretical integration is presented regarding the three constructs chosen for this research.

THE THEORETICAL RELATIONSHIP BETWEEN THE CONCEPTS OF BURNOUT, COPING AND SENSE OF COHERENCE

As shown earlier, Maslach and Jackson (1982) are of the opinion that burnout is a syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment. According to Leiter (1993), emotional exhaustion arises first as a response to a demanding work environment that is, for instance, characterised by a lack of reciprocity at various levels. Increased exhaustion in turn brings about depersonalisation as people attempt to gain emotional distance from their colleagues by way of coping. Reduced personal accomplishment develops relatively independently from the other burnout dimensions, mainly as a function of lack of resources. According to Etzion, Kafry and Pines (1982), the major strategies for dealing with burnout consist of:

- (a) being aware of the problem
- (b) taking responsibility for doing something about it
- (c) achieving some degree of cognitive clarity, and
- (d) developing new tools for coping, improving the range and quality of old tools.

Adequate coping consists first of awareness of the fact that there is a problem. Once the person becomes aware that the problem is largely situational, then the coping strategies are called upon. When people are aware of the existence of a problem and are ready to take responsibility, the third element necessary is cognitive clarity. When people are burned out, they usually cannot easily discriminate the things that can be changed from the things that cannot be changed. The last aspect refers to developing new tools for coping.

Because of numerous reasons, including coping resources, certain individuals may be more predisposed to burnout than others. According to Lazarus and

Folkman (1984), burnout occurs when job demands tax or exceeds the person's adaptive resources. When job demands are too high to cope with, stress reactions are likely to occur.

One of the most crucial steps in managing burnout is for the individual to recognise its signs and symptoms. Unfortunately many persons experiencing burnout are not aware that there is a problem, or at least they are not aware that their distress involves burnout (Muldary, 1983; Pines, 1993). Before any intervention can be effectively implemented, one must become aware of the problem. Once individuals become aware that a problem exists, they must commit themselves to doing something about it. As a form of life crisis, burnout is an experience that presents the individual with two possibilities: an opportunity for personal growth or the risk of further disorganisation and distress. Coping with stress and burnout is contingent upon the individual's belief that something can be done to effect positive change and a commitment to implementing the changes that are within the individual's power. Having confidence in one's ability to gain control of burnout may well be the most important factor in realising the outcome. The belief that something can be done is the belief that pushes one forward toward doing it. But often the very nature of the syndrome precludes this belief and magnifies the erosion of the self-confidence necessary to deal with burnout.

Researchers have also been interested in how people adapt to adverse circumstances (Costa, Somerfield & McCrae, 1996). How people cope with chronic or acute stressful problems and how their coping efforts affect them have been among the major issues considered by psychologists. According to comprehensive models of stress and, more specifically, occupational stress, coping is a buffer factor. In other words it mediates the relationship between job stressors and stress outcome, or between antecedent stressful events and negative outcomes (Endler & Parker, 1990). From the research it is clear that a significant correlation exists between burnout and coping

mechanisms. Harrison (1983) points out that Lazarus has provided researchers with one of the most comprehensive models of coping, which does accommodate the possibility of accelerating the coping process. According to Schaufeli et al. (1993) the organisational environment is essential in understanding and coping with burnout because burnout is defined as a negative, work-related psychological phenomenon.

The sense of coherence differs from many other coping constructs by focusing on those factors which promote coping and well-being, rather than focusing on risk factors contributing to disease. The sense of coherence focus is on the different factors which move individuals towards the healthy end of the sickness/health continuum. Thus, the sense of coherence takes a health-oriented approach to coping. The stresses encountered in life are many and varied, and there are many possible coping procedures. To consistently adopt only one pattern of coping is to fail to respond to the nature of the stressor and therefore to decrease the chances of successful coping. What a person with a strong sense of coherence does is to select the particular coping strategy that seems most appropriate to deal with the stressor being confronted. From the above it seems that there is a significant relationship between coping and sense of coherence.

The salutogenic paradigm (Antonovsky, 1979) focuses on the origins of health and well-ness, the location and development of personal and social resources and adaptive tendencies which relate to the individual's disposition, allowing him/her to select appropriate strategies to deal with confronting stressors. Sense of coherence (SOC) is the global orientation that expresses the extent to which the individual has a pervasive, enduring, though dynamic feeling of coherence, that the stimuli deriving from his/her internal and external environments in the course of living are structured, predictable, and explicable, that the resources are available to meet the demands posed by these stimuli, and that these demands are challenges

worthy of investment and engagement. The sense of coherence predicts the extent to which the individual feels that there is a probability that things will work out well (Antonovsky, 1979). The strength of the sense of coherence is connected to a variety of coping mechanisms, called generalised resistance resources (Antonovsky, 1979), defined as any characteristic of the person, the group, or the environment that can facilitate effective tension management. According to Antonovsky (1987), work has a significant role to play in the shaping of the sense of coherence. A work environment which is predictable, manageable, where the employee can participate in decision making and has a voice in regulating his/her work, enhances the sense of coherence because work is experienced as meaningful.

The salutogenic personality profile incorporates the following behaviour (Viviers & Cilliers, 1999): On the cognitive level, the individual is able to view stimuli originating from the environment in a positive and constructive manner, and to use the information towards effective decision making. On the affective level, the individual functions with self-awareness, is confident, self-fulfilled, views stimuli as meaningful and feels committed towards life in a mature manner. On the motivational level, the individual is driven from within, perceives stimuli as a challenge which directs his/her energy to cope, solve problems and achieve results. The interpersonal characteristics entail the capacity to form meaningful relationships with others within a support system at work and in society.

Burnout as a behavioural phenomenon can be seen as the opposite of or in contrast to salutogenic functioning in the following manner:

On the physical level, the burnout symptoms of distress, illness, extreme physical and psychosomatic reactions, are contrasted to the salutogenic functioning individual's strong resistance resources, including a healthy immune system to fight off illness.

On the cognitive level, the poor performance, concentration, decision making and the making of mistakes, are contrasted to the salutogenic functioning individual's strength in understanding of and making sense out of the demands of his/her environment in a positive, realistic, constructive and truthful way. This leads to effective decision making, problem solving and achievement of results.

On the affective level, the emotional exhaustion and lack of energy is contrasted to an emotional identification with meaningful stimuli and life events. The negative self-concept and feelings of helpless-/ hopeless-/ powerlessness, depersonalisation and the lack of individual distinctiveness, are contrasted to a mature and realistic sense of self, characterised by self and emotional awareness, fulfilment and confidence, a feeling of being in charge, influential and optimistic, with a strong belief in one's own worth.

On the motivational level, the external locus of control is contrasted to an internal locus. The lack of initiative, enthusiasm and interest is contrasted to a commitment towards demands and challenges which are experienced as manageable. The low frustration tolerance and impulse control are contrasted to the capacity to delay one's own need gratification – the individual experiences his/her own sphere of influence vividly and feels in control of his/her inner response, experiences and choices.

On the behavioural level, the impulsiveness, procrastination, doubt and lack of focus is contrasted to stress resistance resources. The individual experiences life as coherent, predictable, and explicable and sees change as a challenge and a growth enriching opportunity. The dependency on stimulants from outside is contrasted by internal balance and tension management.

On the interpersonal level, the disinterest, isolation, withdrawal, indifference, hostility and suspicion are contrasted to establishing, working hard on and being committed to meaningful relationships with significant others, within a support system.

In terms of work, the resistance to being involved, the reduced performance, effectiveness, productivity and job satisfaction, is contrasted to an experience of strength, of trying to make the job and its tasks predictable and manageable; the individual is willing to participate fully and has a sense of accomplishment.

In summary, the integrated theoretical line of reasoning in this research, is as follows:

Burnout is a psychologically negative experience, breaking down the individual's self and work performance. Becoming aware of this situation and symptoms stimulate a first coping mechanism, leading to more action oriented coping mechanisms, functioning as buffer factors, such as confrontation and challenge. As the individual becomes stronger in coping with the demands, the sense of coherence dimensions come to the fore, namely understanding the demands of coping, experiencing them as emotionally meaningful and managing them effectively.

This concludes step 4 of the literature review in total. The empirical part of this study follows in chapter 3 and 4.

CHAPTER 3

EMPIRICAL STUDY

In this chapter the empirical study is discussed. The focus will be on the choice and compilation of the sample, measuring instruments, data gathering, data processing and hypothesis formulation.

3.1 POPULATION AND SAMPLE

In this section the population and sample are discussed, the focus being on their compilation and characteristics.

The population used consisted of engineers and scientists working for a large, international petro-chemical company. The engineers concentrate on conceptual development and project execution whereas the scientists are mainly responsible for the research and development activities of the company. The engineers and scientists are based in three different locations in South Africa, namely Sasolburg, Secunda and Johannesburg. The total population of about 500 engineers and scientists were invited to take part in this study. A letter of invitation from the managing director of the company was sent out to each person in the population. The sample (i.e. those who replied) consists of 272 South African based engineers and scientists from this company. This represents 54,4 percent of the total population. Due to cost implications the international employees were excluded from the sample.

The profile of a typical employee in the sample could be described as being that of a male, with an age ranging between 26 and 35 years old, who is married, working as a engineer or scientist at management level, with a postgraduate degree. The employee could be described as Afrikaans

speaking, consuming about 0 to 4 alcoholic drinks per week and a non smoker.

3.2 MEASURING INSTRUMENTS

In this section the development and rationale, description, administration and scoring, interpretation and the reliability and validity of each measuring instrument are discussed, as well as the motivation for its inclusion in this study.

3.2.1 The Maslach Burnout Inventory (MBI)

The Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1986) was used to measure burnout.

3.2.1.1 Development and rationale of the MBI

The Maslach Burnout Inventory was introduced in the early 1980's (Maslach & Jackson, 1981a; 1981b). The second edition of the test manual was published five years later (Maslach & Jackson, 1986), and recently the third edition appeared (Maslach et al., 1996). To date, the MBI is almost universally used as the instrument to assess burnout.

3.2.1.2 Description of the MBI

The MBI is designed to assess the following three aspects of the burnout syndrome (a separate subscale measures each aspect):

(a) Emotional exhaustion – a reduction in emotional resources, feeling drained and used up. The emotional exhaustion subscale assesses feelings of being emotionally overextended and exhausted by one's work.

(b) Depersonalisation – the increase of negative, cynical and insensitive attitudes towards work, colleagues, clients and/or patients. The

depersonalisation subscale measures an unfeeling and impersonal response towards recipients of one's service, care, treatment or instruction.

(c) Lack of personal accomplishment – a feeling of being unable to meet other's needs and to satisfy essential elements of job performance. The personal accomplishment subscale assesses feelings of competence and successful achievement in one's work with people.

The frequency in terms of which the respondent experiences feelings related to each subscale is assessed using a six-point, fully anchored response format. Burnout is conceptualised as a continuous variable ranging from low to moderate to high degrees of experienced feeling. It is not viewed as a dichotomous variable which is either present or absent.

3.2.1.3 Administration and scoring of the MBI

The MBI takes about 10 to 15 minutes to complete, and full instructions are provided for the respondent. The testing session should be characterised by respondent privacy, respondent confidentiality and avoidance of sensitisation to burnout. It can be carried out individually or in a group session in which privacy is ensured.

The MBI scores for a group of respondents may be treated as aggregate data. Means and standard deviations for each subscale are computed for the entire group. The MBI scores can be correlated with other information obtained from the respondent, such as demographic data, job characteristics, job performance, personality or attitude measures, and health information. The factors that best predict MBI scores can be assessed by multiple regression techniques.

3.2.1.4 Interpretation of the MBI

A high degree of burnout is reflected in high scores on the Emotional Exhaustion (EE) and Depersonalisation (DP) subscales and in low scores on the Personal Accomplishment (PA) subscale. An average degree of burnout is reflected in average scores on the three subscales. A low degree of burnout is reflected in low scores on the Emotional Exhaustion and Depersonalisation subscales and in high scores on the Personal Accomplishments subscale.

Scores are considered high if they are in the upper third of the normative distribution, average if they are in the middle third and low if they are in the lower third. Furthermore, given the limited knowledge about the relationships between the three aspects of burnout, the scores for each subscale are considered separately and are not combined into a single, total score. Thus, three scores are computed for each respondent.

Whatever statistical analyses are performed with the MBI, it is strongly recommended that the original numerical scores be used rather than the categorisations of low, average and high. The power of statistical analysis is greatly enhanced by using the full range of scores. The coding itself is intended primarily as feedback for individual respondents. It enables each respondent to compare him/herself to the overall norm and to perceive various aspects of burnout. However, neither the coding nor the original numerical scores should be used for diagnostic purposes; there is insufficient research on the pattern(s) of scores as indicators of individual dysfunction or the need for intervention.

3.2.1.5 Validity and Reliability of the MBI

Internal validity was estimated by Cronbach's coefficient alpha ($N = 1316$). The reliability coefficients and standard error of measurement for the subscales were the following: Emotional Exhaustion 0,90 and standard error 3,80; Depersonalisation 0,79 and standard error 3,16; Personal Accomplishment 0,71 and standard error 3,73. The test-retest reliability coefficients for the subscales of the MBI are as follows: 0,82 (frequency) for Emotional Exhaustion, 0,60 (frequency) for Depersonalisation, and 0,80 (frequency) for Personal Accomplishment. Finally, all values are significant beyond the 0,001 level (Maslach & Jackson, 1981a).

3.2.1.6 Motivation for using the MBI

The MBI is the most widely-used and well-validated self-report questionnaire on burnout. Because the development of the MBI was based on the need for an instrument to assess burnout as experienced by a wide range of human service workers, it was thought to be applicable to employees in the petrochemical company, where engineers and scientists have to manage other people and deal with people issues on a daily basis. Its inclusion in the measuring battery will allow a better understanding of the personal, social and institutional variables that either promote or reduce the occurrence of burnout. In addition to the significance of this knowledge for theories of emotion and of job stress, such information will have the practical benefit of suggesting modifications in recruitment, training, and job design that may alleviate this serious problem.

3.2.2 The COPE Questionnaire (COPE)

The COPE Questionnaire (Carver et al., 1989) was used to measure coping.

3.2.2.1 Development of and rationale for the COPE

The COPE (Carver et al., 1989) developed into a multidimensional coping inventory to assess the different ways people respond to stress. The COPE inventory has gone through several generations in its development and a number of theoretically important factors were identified. The final version of the COPE inventory contains 13 scales with 4 items each.

3.2.2.2 Description of the COPE

The COPE is a multi-dimensional self-report coping-questionnaire that contains 53 items. The instrument is made up of 13 different sub-scales, each containing four items that measure 13 different coping strategies. Nine of the coping strategies were developed from theoretical arguments while four were identified by research to be important aspects of coping. The sub-scales are divided into three sections namely problem-focused coping strategies, emotion-focused coping strategies and so called less-serviceable coping strategies. The 14th sub-scale (alcohol- and drug disengagement) was added later and is made up of only one item. The authors distinguish the following sub-scales:

Problem-focused coping strategies:

(a) Active Coping (AC) - This indicates an active attempt to remove the source of stress, to minimise the effect thereof, or to avoid the source of stress.

(b) Suppressing of Competing Activities (SC) - Other projects or activities are set aside in order to devote all one's attention to the handling of the current problem.

(c) Restraint Coping (RC) - The person waits for the right moment to solve the problem and impulsive or premature action is avoided.

(d) Seeking Social Support for Instrumental Reasons (SSSIR) - Advice, help and information are gathered to solve the problem.

Emotion-focused coping strategies:

(e) Positive Reinterpretation and Growth (PRG) - The aim is to handle the upsetting emotions and not the source of stress per se.

(f) Acceptance (Accept) - The person accepts the source of stress as a reality. This is especially useful when the source of stress cannot be removed or avoided.

(g) Turning to Religion (TTR) - The person turns to religious expression to understand and deal with the source of stress. The person finds comfort and peace in his or her relationship with God.

(h) Denial (Denial) - This indicates that the source of stress is perceived as unreal and no active effort is aimed at handling it.

Less serviceable coping strategies:

(i) Focus on and Venting of Emotions (FVE) - The person expresses emotions regarding the source of stress. This can be negative if this upsets the source of social support.

(j) Behavioural Disengagement (BD) - This usually follows a feeling of helplessness, when the person stops all effort to handle the source of stress.

3.2.2.3 Administration and scoring of the COPE

The questionnaire takes approximately 10 minutes to complete, but there is no time restriction. The COPE has a self-report format in which participants have to describe what they mostly do or think in stressful situations. A four-

point Likert scale is used to score the questionnaire, that ranges from 1 (I usually don't do this at all), to 4 (I usually do this) (Carver et al., 1989).

3.2.2.4 Interpretation of the COPE

The marked scores for each sub-scale are added. The scales with the highest scores indicate the coping strategies used most frequently. The total score can be a minimum of 53 and a maximum of 212.

3.2.2.5 Reliability and validity of the COPE

Evidence for internal consistency of the COPE scales comes mainly from Cronbach alphas (see Table 3.1) that ranges from 0,45 for Mental Disengagement to 0,92 for Turning to Religion (Carver et al., 1989). Evidence concerning the test-retest reliability of the various scales comes from two samples. Eighty-nine students completed the COPE in an initial session and again 8 weeks later. An earlier sample of 116 students had completed a nearly final version of the item set over an interval of 6 weeks. These correlations range from 0,46 to 0,86 and 0,42 to 0,89 and are also shown in the table 3.1 (Carver et al., 1989).

Table 3.1

Cronbach's Alpha Reliability and Test-Retest Reliabilities of the COPE

COPE scales	μ	r	r ²
Active coping	0,62	0,56	0,69
Planning	0,80	0,63	0,69
Suppression of competing activities	0,68	0,46	0,64
Restraint coping	0,72	0,51	-
Seeking social support - instrumental	0,75	0,64	0,76
Seeking social support - emotional	0,85	0,77	0,72
Positive reinterpretation and growth	0,68	0,48	0,63
Acceptance	0,65	0,63	0,61
Turning to religion	0,92	0,86	0,89
Focus on and venting of emotions	0,77	0,69	-
Denial	0,71	0,54	-
Behavioural disengagement	0,63	0,66	0,42
Mental disengagement	0,45	0,58	0,56
Alcohol-drug disengagement	-	0,57	0,61

(Carver et al., 1989)

In general, these values were acceptably high with only one falling below 0,6 (Mental Disengagement). According to Carver et al. (1989) this scale differs from the others in being more of a multiple-act criterion, and thus this lower reliability was not entirely unexpected. The correlations for the test-retest reliability suggest that the self-reports of coping tendencies that are measured by the COPE are relatively stable, although they do not in general appear to be as stable as personality traits.

3.2.2.6 Motivation for using the COPE

By means of the literature review it was found that the COPE is one of the most widely-accepted and most commonly-used scales for coping strategies and that it consists of sound psychological constructs across cultural groups (Carver et al., 1989). In South African populations high reliability- and validity indices are obtained (Wissing & Du Toit, 1994). The scale is also conceived as a more fine-grained dispositional measure of individual differences in coping than previous instruments, and it reflects a balanced view about the disposition versus situation issue. Common as well as less common coping strategies are measured with the instrument, and the questions are not bound to a specific situation. The questionnaire measures a wide variety of coping strategies, and the aim is thus to establish what the person generally prefers.

3.2.3 Sense of Coherence Questionnaire (SOC)

The Sense of Coherence questionnaire (SOC), originally called the Orientation to Life questionnaire (Antonovsky, 1983), was used to measure those personality factors which promote coping and well-being.

3.2.3.1 Development of and rationale for the SOC Questionnaire

The Sense of Coherence questionnaire was developed on the basis of the sense of coherence construct (Antonovsky, 1983). The sense of coherence (SOC) is seen as a major determinant of maintaining one's position on the health ease/disease continuum. The immediate aim of constructing this questionnaire was to measure sense of coherence in order to test the core hypothesis that the sense of coherence is causally related to health status (Antonovsky, 1987). This questionnaire has been selected in this research to measure the theoretical concept sense of coherence (SOC), and appeared in print in Antonovsky (1983). The rationale for this questionnaire is that it

measures an individual's personality disposition and global orientation regarding the handling of stimuli in terms of three components, namely comprehensibility, manageability and meaningfulness.

3.2.3.2 Description of the Sense of Coherence Questionnaire

The sense of coherence questionnaire measures those personality factors which promote coping and well-being. This questionnaire is based on a salutogenic or health-oriented rather than a disease-oriented approach to psychological functioning and measures the extent to which the individual sees the world around him/her as predictable, manageable and meaningful, that is, "how people manage stress and stay well" (Antonovsky, 1979, 1987; Strümpher, 1990).

The 29 item Likert type self-rating scale is scored between one and seven per item. A score of one on an item indicates a low score and a score of seven on an item indicates a high score. For Antonovsky (1987, p. 86) sense of coherence (SOC) consists of three components that are "inextricably intertwined", although they can be distinguished theoretically. The three components are:

(a) Comprehensibility (11 items) - The stimuli deriving from one's internal and external environments in the course of living are structured, predictable, and explicable. A high score is indicative of an individual who senses that life is ordered, consistent and makes sense. With reference to the future, it implies predictability. A low score indicates a sense of chaos, of randomness; life is accidental and cognitively not understandable;

(b) Manageability (10 items) - The resources are available to one to meet the demands posed by these stimuli. A high score is indicative of being able to perceive stressors as manageable and therefore to select appropriate resources, those under one's own control, available from others, or from a

legitimate authority, such as God, rather than to react with helplessness. A low score is indicative of such a helpless reaction;

(c) Meaningfulness (8 items) - These demands are challenges worthy of investment and engagement. A high score indicates that life is seen as a challenge, as worthy of commitment. A low score indicates that life is seen as a burden and that challenges perceived as paralysing threats, are reacted to with negative behaviour based on self-fulfilling prophecies.

3.2.3.3 Administration of the SOC Questionnaire

The SOC questionnaire is administered individually or in groups. The respondent reads the instructions on the questionnaire and then proceeds to indicate his / her responses on the answer sheet provided. Reverse scoring is required for 13 items. There is no time limit in which to complete this questionnaire. The total score is the sum of the three subscales and the SOC is reported as a single score.

3.2.3.4 Interpretation of the SOC Questionnaire

The highest possible score is 203. The total score gives an indication of the respondent's sense of coherence. A high score indicates a respondent rated high in sense of coherence, whereas a low score indicates a respondent rated low in sense of coherence. The three components namely, comprehensibility, manageability and meaningfulness, provide a profile of the respondent's sense of coherence.

Persons with a strong sense of coherence score significantly higher on the three scales. Those who have a low score on the three components would reflect their perception that their environment seems less ordered and

predictable; tasks appear less manageable, and to a large extent seem meaningless.

3.2.3.5 Reliability and Validity of the SOC Questionnaire

The consistently high level of Cronbach's alpha, which ranges from 0,84 to 0,93 points to a high degree of internal consistency and reliability in the sense of coherence (SOC) questionnaire (Antonovsky, 1987). Antonovsky (1987) presented evidence for the convergent and discriminant validity of the SOC questionnaire. The analyses of the relations between the SOC questionnaire and a variety of health and other measures led Antonovsky (1987) to conclude that the SOC score was consistently and significantly related to all positive health measures, while being significantly and negatively related to all illness measures.

According to Antonovsky (1987) there is sufficient evidence to warrant the tentative conclusion that the scale is an adequate representation of the sense of coherence construct. Antonovsky concludes that the twenty-nine items of the SOC questionnaire "do indeed cover important aspects designed to be measured" (p. 82).

3.2.3.6 Motivation for using the SOC Questionnaire

The sense of coherence is the central construct in the paradigm of salutogenesis. The SOC questionnaire is selected as a measure of the extent to which an individual sees life as comprehensible, manageable and meaningful – a salutogenic orientation (Antonovsky, 1987) on the intrapersonal level. High levels of reliability and validity reported by Antonovsky (1987) contribute to the motivation for the use of the SOC questionnaire as a measure of the sense of coherence construct. The SOC

questionnaire is thus appropriate to measure individuals on the illness – optimal health continuum.

3.3 DATA GATHERING

The following research procedure was followed:

Approval was obtained from the executive committee of the company to conduct the study. A letter of invitation was sent out to the population under the name of the managing director.

Sessions were scheduled for the three different sites. Two days each for Secunda, Sasolburg and Rosebank, Johannesburg, were allocated. On each of the two days, three sessions were available for people to complete the instruments. An additional day with three sessions was scheduled for Secunda due to the large number of employees there.

At the beginning of each session, the researcher explained to the respondents the objectives of the research and its confidentiality. The respondents were invited to complete the questionnaires as openly and honestly as possible without any fear that the individual results would be discussed with management.

The researcher stipulated that participation was voluntary. No time limits were set for answering the questionnaires. The researcher was at all times present to answer any questions.

The procedure for the administering and scoring of the measuring instruments was strictly followed as explained in 3.2.

3.4 DATA PROCESSING

The statistical analysis was carried out with the help of the SAS programme (SAS Institute, 2000).

3.4.1 Biographical data

The biographical characteristics of the sample will be given in chapter 4.

3.4.2 Descriptive statistics and internal reliability of the chosen instruments

Descriptive statistics were used to analyse the data. Means, standard deviations, skewness and kurtosis are used to describe and compare results. Three main measures of central tendency are the mean, median, and mode. They are epitomes of the sets of measures from which they are calculated. They indicate what sets of measures “are like” on average, but are also compared to test relations. Moreover, individual scores can be usefully compared to them in order to assess the status of the individual (Huysamen, 1993). In this study, the mean is used as a measure of central tendency. The standard deviation approximates the average distance of the individual scores from the mean. The higher the standard deviation, the greater the distances are, on average, from the mean (Huysamen, 1993). Two components of normality are skewness and kurtosis. Skewness has to do with the symmetry of the distribution; a skewed variable is a variable whose mean is not in the centre of the distribution. Kurtosis has to do with the peakedness of a distribution; a distribution is either too peaked (with short, thick tails) or too flat (with long, thin tails) (Huysamen, 1993).

Cronbach’s coefficient alpha is computed to assess the internal consistency reliability of the measuring instruments that have different scoring and response scales (Huysamen, 1993). This index is indicative of the extent to

which all the items in the questionnaire are measuring the same characteristics (Huysamen, 1993). High internal consistency implies a high generalisability of items in the test as well as items in parallel tests.

3.4.3 Inter-item correlation

Inter-item correlation coefficients are used to determine whether the internal consistencies of the constructs are not so high that they affect the validity. Clark and Watson (1995) specified inter-item correlations between 0,15 and 0,50 as acceptable.

The product-moment correlation (r) is used to determine the relationship between the variables. The product-moment coefficient of correlation is used to calculate indices of relation between sets of ordered pairs, in order to obtain more precise estimates of the direction and degree of relations. This coefficient of correlation is based on the concomitant variation of the members of sets of ordered pairs. If they covary – vary together: high values with high values, low values with low values, or high values with low values, and so on – it is said that there is a positive or negative relation, as the case may be. If they do not covary, it is said there is “no” relation (Clark and Watson, 1995). Thus, if a relationship exists between the variables, it can be termed a positive relationship. A negative relationship occurs when a decrease in the measurement of one variable leads to an increase in the other variable (Clark and Watson, 1995).

According to Steyn (1999), there is an increasing need for researchers to interpret results according to effect sizes and practical significance rather than statistical significance. Statistical significant tests and p-values are being used to determine if results are significant. Small p-values (smaller than 0,05) are frequently used as sufficient evidence that results are of statistical significance. However, this is not always a reliable method. Often statistically

significant results are of little practical importance. To determine whether results are of practical significance, the researcher would compute effect sizes.

According to Cohen (1988) the following are the cut-off points for the practical significance of the correlation coefficient between variables:

$r = 0,10$ – small effect

$r = 0,30$ – medium effect

$r = 0,50$ – large effect

In this study, r -values larger than 0,30 (medium effect) are considered as practically significant.

3.4.4 Multiple correlation

The multiple correlation coefficient (R) is used to determine the correlations between multiple personality constructs (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness), coping and the constructs of burnout (Emotional Exhaustion, Depersonalisation and Personal Accomplishment). The multiple correlation coefficient is one of the links that bind together the various aspects of multiple regression and analysis of variance. R is the highest possible correlation between a least-squares linear composite of the independent variables and the observed dependent variable (Huysamen, 1993).

3.4.5 Stepwise multiple regression analysis

A stepwise multiple regression analysis was conducted to determine the proportion of variance in the dependent variable (burnout) that is predicted by the independent variables (personality traits and coping). The effect size

(which indicates practical significance) in the case of multiple regression is given by the following formula (Steyn, 1999):

$$f^2 = R^2 / (1 - R^2)$$

A cut-off point of 0,35 (large effect, Steyn, 1999) was set for the practical significance of f^2 .

The value of R^2 is used to determine the proportion of the total variance of the dependent variable that is explained by the independent variables. The F-test is used to test whether a significant regression exists between the independent and dependent variables. Steyn (1999) suggested that effect size be used together with multiple regression, especially when working with a total population (Steyn, 1999). Cohen suggested the following guidelines for effect size:

$f^2 = 0,01$ – small effect

$f^2 = 0,10$ – medium effect (Cohen suggested 0,15)

$f^2 = 0,35$ – large effect

3.5 FORMULATION OF HYPOTHESIS

In conjunction with the specific research objectives the following research hypothesis is formulated:

Hypothesis Statement:

There is no relationship between burnout, coping and sense of coherence amongst engineers and scientists.

As a null hypothesis one expects to find no relationship between burnout, coping and sense of coherence. The alternative would be that such a relationship exists. A correlation test will be applied to test the null hypothesis.

3.6 CHAPTER SUMMARY

This chapter dealt with the method used for the empirical study. The selection and compilation of the sample, measuring instruments, data gathering, and data processing were discussed as well as relevant statistical analyses. The research hypothesis was stated in terms of the present study.

CHAPTER 4

RESULTS

In this chapter the results of the empirical study are reported and discussed. Firstly, the results are reported. Secondly, an interpretation of the data will be presented. Thirdly, an integration of the data and a discussion will follow.

4.1 BIOGRAPHICAL STATISTICS

The biographical information is reported for gender, age, marital status, work environment, job level, qualification, language, alcohol consumption, smoking habits and functional groups in the organisation.

Table 4.1

Gender distribution

Characteristic	Category	Frequency	Percentage
Gender	Male	212	77.9%
	Female	58	21.4%
	Not Answered	2	0.7%

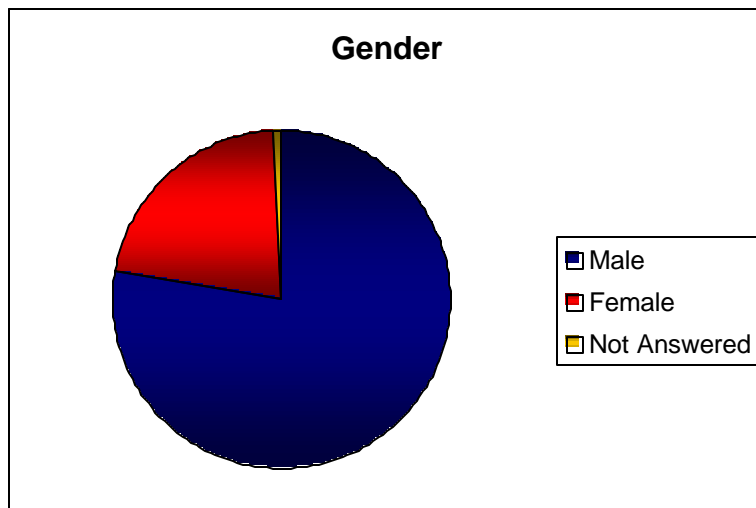


Table 4.1 shows that there are significantly more males in the sample than females. According to table 4.1 almost 80% of the sample consists of males. The sample could therefore be described as a male dominated group with only about 20% females.

Table 4.2

Age distribution

Characteristic	Category	Frequency	Percentage
Age	20-25 years	33	12.1%
	26-30 years	70	25.8%
	31-35 years	68	25%
	36-40 years	28	10.3%
	41-50 years	46	16.9%
	51-60 years	27	9.9%

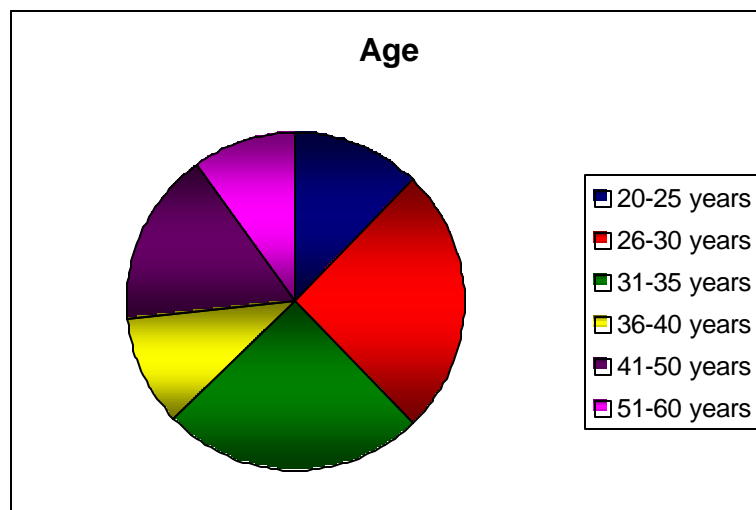
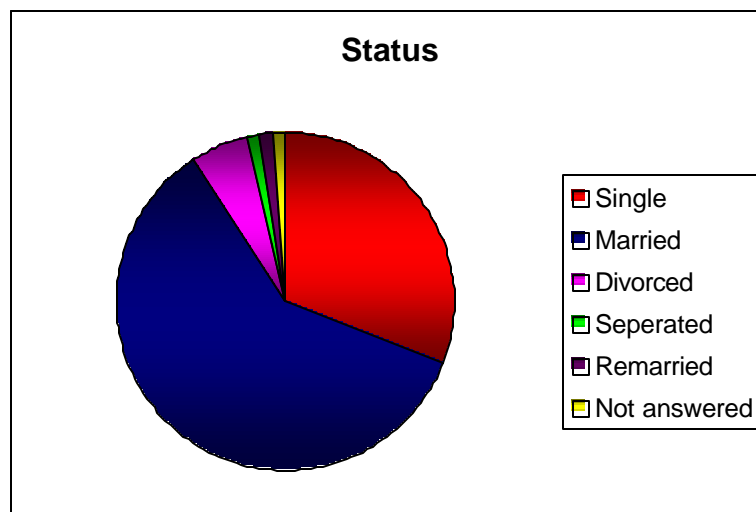


Table 4.2 shows that approximately 50% of the sample is between the ages of 26 and 35. The members of the largest group are between the age of 26 and 30 years old. Only 37.1% of the sample is between the ages of 36 to 60.

Table 4.3

Marital status distribution

Characteristic	Category	Frequency	Percentage:
Marital Status	Single	84	30.9%
	Married	163	59.9%
	Divorced	15	5.5%
	Separated	3	1.1%
	Remarried	4	1.5%
	Not answered	3	1.1%



According to table 4.3 approximately 60% of the sample is married. The second largest group is single, which is represented by approximately 30% of the sample. Only 5.5% of the sample is divorced.

Table 4.4

Work environment distribution

Characteristic	Category	Frequency	Percentage
Work environment	Process Engineer	131	48.2%
	Project Management	22	8.1%
	Engineering (Mechanical, Electrical, etc.)	38	13.9%
	Research & Development	62	22.8%
	Other	19	7%

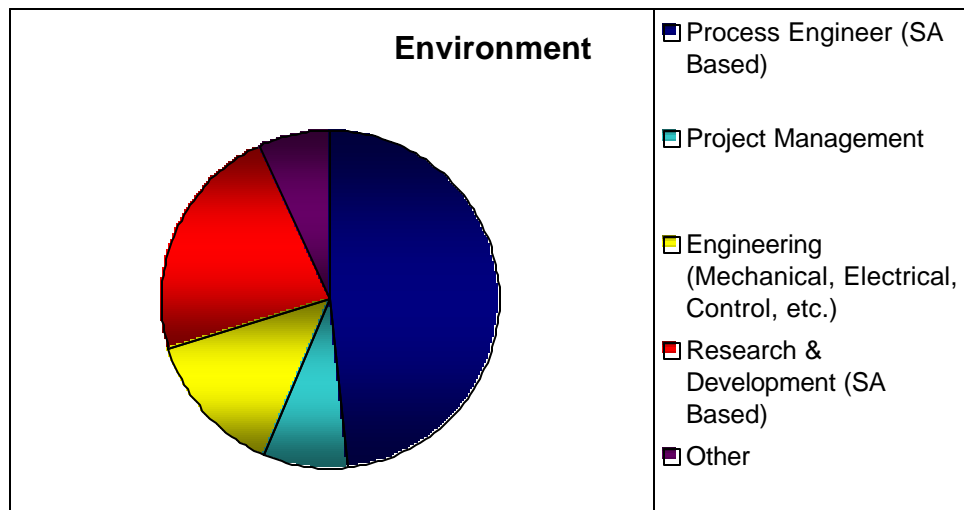


Table 4.4 shows that approximately 48% of the sample comprises process engineers. The second largest group consists of scientists (22.8%) working in a Research and Development area. Only 8.1% of the sample indicated that they are working as part of the project management group.

Table 4.5

Job level distribution

Characteristic	Category	Frequency	Percentage
Job Level	Level 7	25	9.2%
	Level 6C	70	25.8%
	Level 5B/ Level 5A	75	27.6%
	Level 4	90	33.1%
	Level 3	5	1.7%
	Level 2+	3	1.1%
	Other	4	1.5%

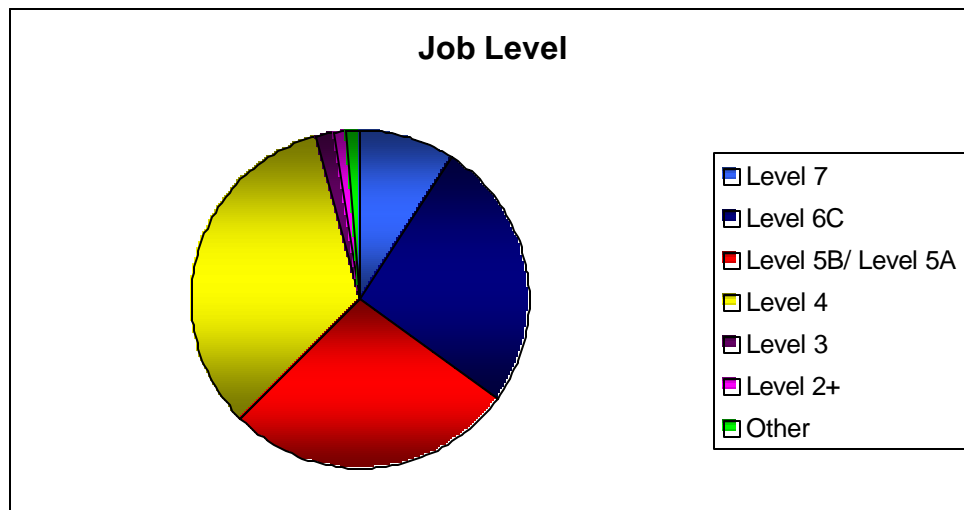


Table 4.5 shows that the largest group of in the sample (33%) are on Level 4 (Paterson – D4). A significant group of people in the sample (28%) are at level 5 (Paterson – D2 and D3).

Table 4.6

Qualification distribution

Characteristic	Category	Frequency	Percentage
Qualification	Degree	107	39.4%
	Postgraduate degree	138	50.7%
	Other (diploma, etc.)	27	9.9

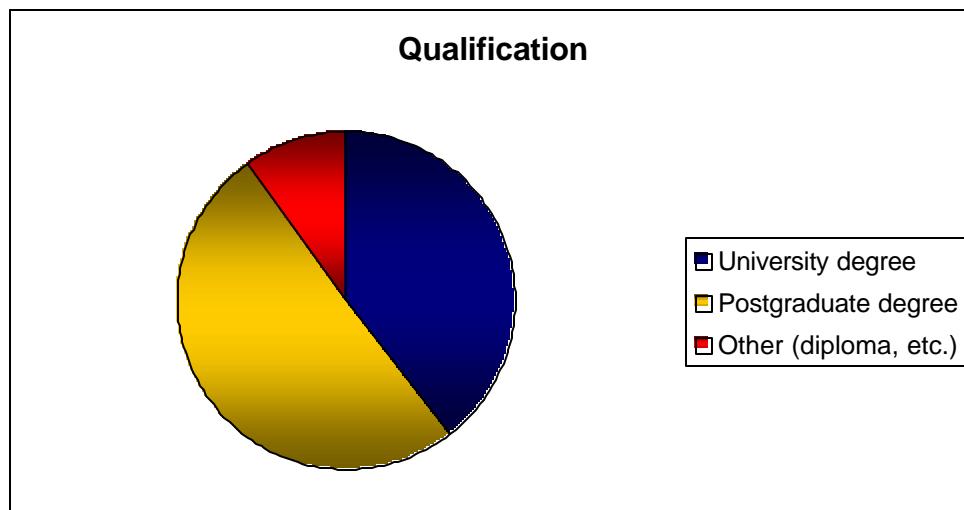


Table 4.6 shows that approximately 50% of the sample has, in addition to a degree, also obtained a postgraduate degree.

Table 4.7

Language distribution

Characteristic	Category	Frequency	Percentage
Language	Afrikaans	143	52.6%
	English	98	36%
	African	25	9.2%
	Other	6	2.2%

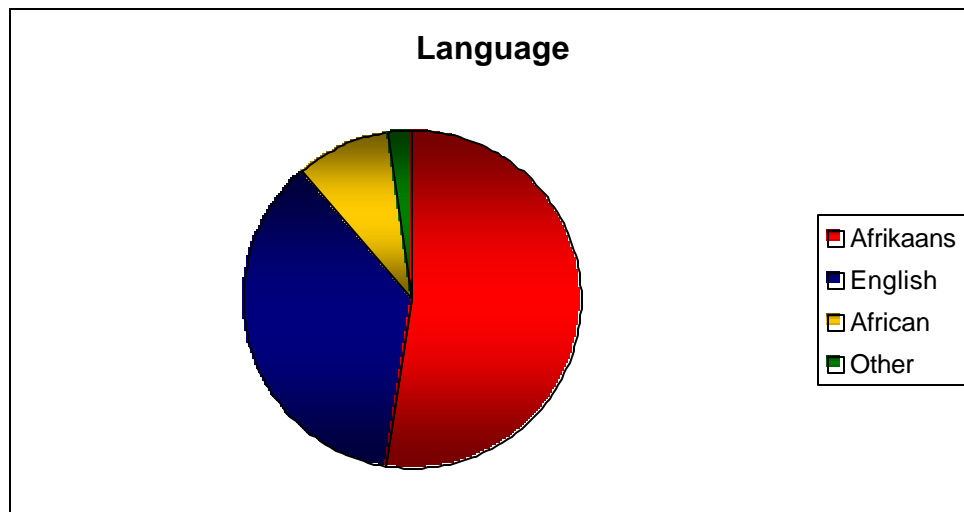


Table 4.7 shows that more than 50% of the sample is Afrikaans speaking. A significant percentage (36%) is English speaking.

Table 4.8

Alcoholic drinks per week

Characteristic	Category	Frequency	Percentage
Alcoholic drinks / week	0-4 drinks/week	215	79%
	5-7 drinks/week	30	11%
	8-14 drinks/week	14	5.1%
	15 or more drinks/week	8	3%
	Not answered	5	1.9%

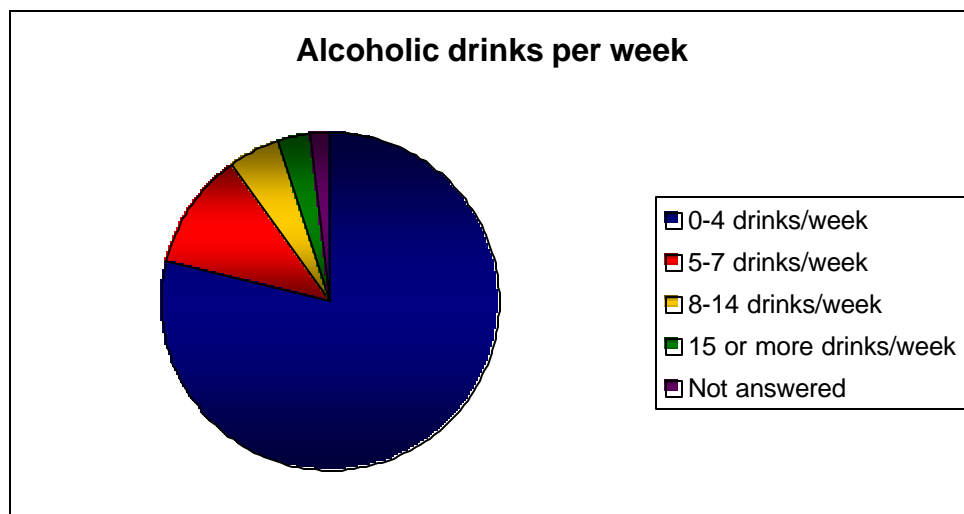


Table 4.8 shows that almost 80% of the sample drinks less than 4 drinks per week. Only 3% of the sample drinks more than 15 drinks per week.

Table 4.9

Smoking distribution

Characteristic	Category	Frequency	Percentage:
Smoking	Yes	36	13.2%
	No	233	85.7%
	Not answered	3	1.1%

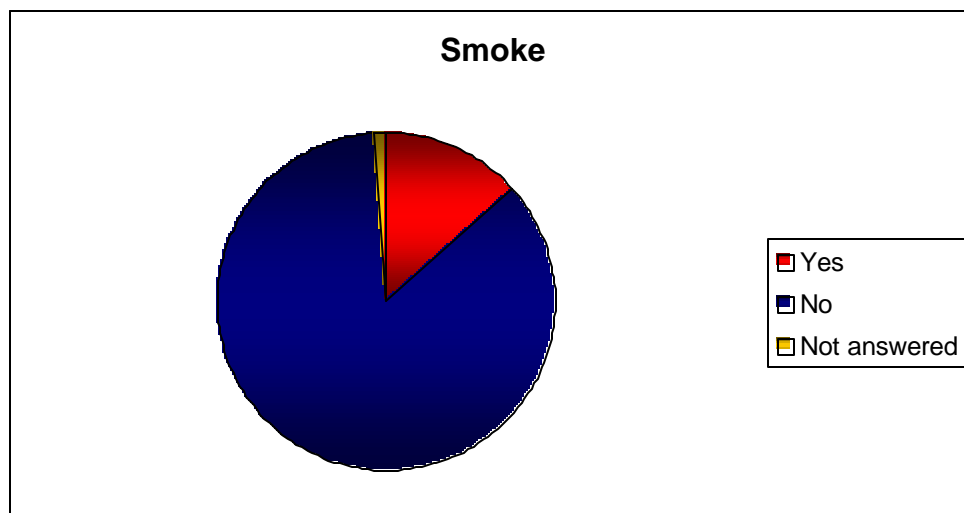


Table 4.9 shows that more than 85% of the people in the sample do not smoke. Only 13.2% of the sample reported that they were smokers.

Table 4.10

Functional group distribution

Characteristic	Category	Frequency	Percentage
Functional group	Research & Development	60	22%
	Concept Development	30	11%
	Engineering	26	9.4%
	OPI	31	11.3%
	SSF	55	20.2%
	Project Management	20	7.3%
	Other	50	18.8%

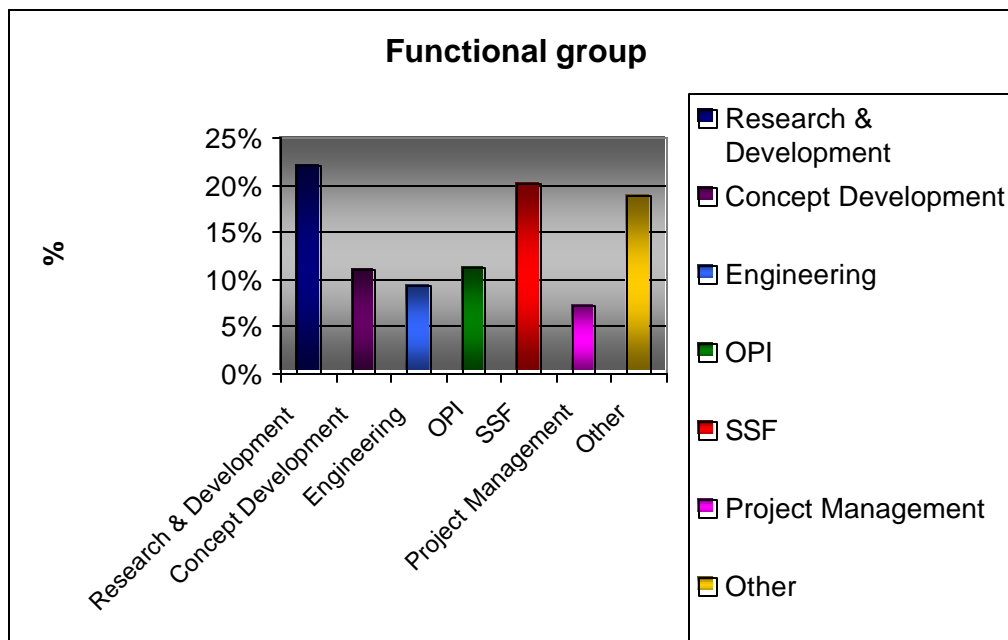


Table 4.10 shows that the largest group of the sample is working in the Research & Development environment (22%).

4.2 DESCRIPTIVE STATISTICS OF THE MEASURING INSTRUMENTS

The descriptive statistics for the different instruments are reported. The mean, standard deviation (SD), skewness and kurtosis of the different questionnaires and their sub-scales are computed. Coefficient alphas (α) are computed to determine the internal consistency of the measuring instrument. The mean inter-item correlation (r-Mean) is also determined for the three measuring instruments.

4.2.1 The Maslach Burnout Inventory (MBI)

The descriptive statistics of the Maslach Burnout Inventory are reported in table 4.11.

Table 4.11

Descriptive Statistics, Alpha Coefficients and Inter-Item Correlation Coefficients of the Maslach Burnout Inventory

Item	Valid N	Mean	SD	Skewness	Kurtosis	Range	α
Emotional Exhaustion (EX)	272	14,15	6,64	0,08	0,68	29	0,86
Depersonalisation (CY)	272	8,04	5,52	0,45	-0,60	22	0,85
Personal Accomplishment (PE)	272	27,79	5,43	-1,62	4,31	34	0,85

Note:

Low Personal Accomplishment scores imply high burnout levels;

Emotional Exhaustion scores 12 are "low"; 13-18 are "average"; and scores 19 are "high";

Depersonalisation scores 6 are "low"; 7-10 are "average"; and scores 11 are "high";

Personal Accomplishment scores 27 are "high"; 28-30 are "average; and scores 31 are "low".

The scores of all the scales are normally distributed. The Cronbach alpha coefficients of all the scales in table 4.11 are considered to be acceptable compared to the guideline of $\alpha > 0,70$ (Nunnally & Bernstein, 1994). Table 4.11 shows Cronbach alpha coefficients varying from 0,85 to 0,86 for the Maslach Burnout Inventory. Furthermore, the inter-item correlations are considered acceptable compared to the guideline of $0,15 < r < 0,50$ (Clark & Watson, 1995). It appears that the scales have acceptable levels of internal consistency. Compared with the norms provided by Maslach and Jackson (1986), the scores are average and the level of burnout could therefore be described as moderate. The scores on the MBI are relatively normally distributed, with low skewness and kurtosis except for Personal Accomplishment.

The descriptive statistics in table 4.11 could be interpreted as moderate levels of burnout.

- (a) The exhaustion level (14,15) for the sample indicates moderate burnout (13-18);
- (b) The score of 8,04 for Depersonalisation indicates average burnout (7-10);
- (c) Personal Accomplishment in this sample is high (27, 79) and tends to add to moderate burnout levels.

If a comparison is drawn between the results of a similar study that was done by Rothmann, Jackson and Kruger (2003) on the Potchefstroom Town Council and those of this study it is interesting to note that on all three sub items, Emotional Exhaustion, Depersonalisation and Professional Efficacy, the scores are higher than those of the Potchefstroom Town Council. The comparison is shown in table 4.12. Although the scores on the sub elements of the MBI for

this sample could be described as “moderate”, it is alarming to see that all three elements score higher than the Town Council study, also based in South Africa.

Table 4.12

Comparison of the scores for the MBI between Engineers/Scientists and a Town council

Item	Engineers / Scientists Mean	Potchefstroom Town Council Mean
Emotional Exhaustion (EX)	14,15	11,92
Depersonalisation (CY)	8,04	7,17
Personal Accomplishment (PE)	27,79	28,34

The sample in this study scored higher on Emotional Exhaustion. The implication of this would be the existence of feelings amongst these engineers and scientists of being overextended and depleted of one's emotional and physical resources. The sample in this study also scored higher on Depersonalisation. A higher score on depersonalisation would refer to the interpersonal dimension of burnout and represents a negative, callous or detached response to various aspects of the job. The third element, namely, Personal Accomplishment, also scored higher for this sample than the Town Council. Personal Accomplishment refers to the self-evaluation dimension of burnout and indicates a feeling of competence, productivity and achievement at work. A high score on this element would have the negative implication that people will experience a lack of personal achievement.

4.2.2 The Cope Questionnaire (COPE)

The descriptive statistics of the COPE for the total sample are reported in table 4.13.

Table 4.13

Descriptive Statistics, Alpha Coefficients and Inter-Item Correlation Coefficients of the COPE.

Item	Valid N	Mean	SD	Skewness	Kurtosis	Range	r (Mean)	∞
Active Coping	272	25,69	3,99	-0,49	-0,08	20	0,39	0,84
Expressing Emotions	272	15,81	4,81	0,52	-0,40	21	0,48	0,86
Turning to Religion	272	10,60	4,16	-0,31	-1,22	12	0,79	0,94
Seeking Social Support (SSSIR)	272	10,86	2,87	-0,12	-0,65	12	0,54	0,83
Denial	272	7,01	2,15	1,32	1,49	11	0,29	0,64
Acceptance	272	11,19	2,71	-0,33	-0,52	12	0,39	0,72
Behavioural Disengagement	272	6,22	2,11	0,96	0,46	10	0,36	0,69
Positive Reinterpretation & Growth	272	9,47	1,84	-0,54	-0,10	8	0,47	0,72
Restraint Coping	272	7,75	1,83	0,03	-0,03	9	0,38	0,65
Suppression of competing activities	272	8,13	1,97	-0,16	-0,32	9	0,39	0,66

The mean scores for the COPE vary between 25,69 (Active Coping) and 6,22 (Behavioural Disengagement).

Table 4.13 shows that the sample tends to use the following coping strategies:

(a) Active Coping - The individual is taking active steps trying to remove the stressor or to ameliorate its effects. He/she is initiating direct action, increasing his or her efforts, and tries to execute a coping attempt in stepwise fashion.

(b) Expressing Emotions - The person expresses emotions regarding the source of stress. This can be negative if this upsets the source of social support.

(c) Acceptance - The person accepts the source of stress as a reality. This is especially useful when the source of stress cannot be removed or avoided.

(d) Seeking Social Support - The person seeks sympathy, moral support and understanding from others.

(e) Turning to Religion - The person turns to religious expression so as to understand and deal with the source of stress.

The following coping strategies scored the lowest in the sample:

(a) Behavioural Disengagement - The person reduces his/her effort to deal with the stressor, even giving up the attempt to attain goals with which the stressor is interfering.

(b) Denial - The person refuses to believe that the stressor exists, or tries to act as though the stressor is not real.

(c) Restraint Coping - The person waits for the right moment to solve the problem and impulsive or premature action is avoided.

(d) Suppression of competing activities - Other projects or activities are set aside in order to devote all one's attention to the handling of the current problem.

The skewness and kurtosis results, as shown in table 4.13 are indicative of a normal distribution. However, there is a skewed distribution regarding Denial. This is also indicated by its higher kurtosis. It is also to be remarked that Denial rates as the second lowest coping strategy used by the total group.

According to the guideline of Nunnally and Bernstein (1994) ($\alpha > 0,80$), the alpha coefficients of the strategies Active Coping, Expressing Emotions, Turning to Religion and Seeking Social Support are acceptable.

Regarding the inter-item correlation coefficients for the COPE, the values vary from 0,29 (Denial) to 0,79 (Turning to Religion). The inter-item correlation coefficients of Turning to Religion and Seeking Social Support are above the guideline of 0,50, as suggested by Clark and Watson (1995). A possible reason for these high scores may be the fact that these subfactors are narrowly defined and the items of each subfactor are very similar.

4.2.3 The Sense of Coherence Questionnaire (SOC)

The descriptive statistics of the SOC for the total sample are reported in table 4.14.

Table 4.14

Descriptive Statistics, Alpha Coefficients and Inter-Item Correlation Coefficients of the SOC

Item	N	Mean	SD	Skewness	Kurtosis	Range	r (Mean)	α
Sense of Coherence (Total OLQ)	272	140,48	22,16	-0,47	-0,35	104	0,26	0,91
Comprehensibility	272	46,84	9,21	-0,20	-0,77	41	0,24	0,78
Manageability	272	50,29	8,76	-0,53	-0,10	43	0,30	0,80
Meaningfulness	272	43,35	7,30	-0,82	0,21	38	0,37	0,82

The mean scores for the SOC vary between 43,35 (Meaningfulness) and 50,29 (Manageability). The mean for the sample on the total sense of coherence questionnaire is 140,48 with a standard deviation of 22,16. The highest possible score that could be achieved is 203. The higher the score the better the view the individual will have of his/her world as being comprehensible, manageable and meaningful. The mean score for the SOC falls between 160,44 (standard deviation of 16,69) for army officers in Israel, and 129,5 (standard deviation of 24,5) for undergraduates at a university in the United States.

According to Strümpher (1990), there are four spheres that cannot be excluded if a person is to maintain a strong SOC, namely, the individual's feelings, immediate interpersonal relations, the major sphere of activity and the existential issues of death, inevitable failures, shortcomings, conflict and isolation. The strong-SOC person seeks a balance between rules and strategies, between stored and potential information.

The total score gives an indication of the respondent's sense of coherence. A high score indicates a respondent high in sense of coherence, whereas a low score indicates a respondent low in sense of coherence. Normative data on the SOC questionnaire present means and standard deviations of a considerable diversity for a variety of samples. This is acceptable in the light of the idea that the questionnaire should produce differences on mean scores among samples that, on theoretical grounds, are expected to differ. The distribution of responses, as shown by the range of score and the standard deviations, indicates an instrument that makes a considerable distinction between members of different populations and different cultures.

Levert, Lucas and Ortlepp (2000) reported significant correlations between two components of burnout (exhaustion and depersonalisation) and sense of coherence in a group of psychiatric nurses in South Africa. Goldberg (1993) found significant correlations between social workers' sense of coherence and exhaustion ($r = -0,30$), as well as between their sense of coherence and personal accomplishment ($r = -0,34$). Rothmann, Malan and Rothmann (2001) also found significant correlations between sense of coherence and exhaustion ($-0,56$), depersonalisation ($-0,41$) and personal accomplishment ($0,48$). Strümpfer (1990) indicated that an individual with a strong sense of coherence will be able to cope by applying resources within that individual or other individual's control, rather than by becoming helpless.

Although the research design does not allow one to prove causal relationships, it seems likely that a strong sense of coherence could provide protection against burnout because it starts developing early in life outside the work environment, and burnout (if it does occur) sets in only after an individual has been employed for some length of time (Strümpfer, 2002). A tentative conclusion is that sense of coherence, which is regarded as a "meaning-providing variable" (Strümpfer, 2002), may assist in the warding-off of burnout. Individuals with a strong sense of coherence could also

experience burnout but will, in the long term, probably benefit even from that. They are likely to use the temporary condition of anguish as an opportunity for growth: for resolving pre-existing and present problems, for reorganising their life and work circumstances, and for going forward with newly discovered skills and perspectives on self and life (Strümpfer, 2002).

4.3 INTER-ITEM CORRELATIONS

Each construct's dimensions correlated with each other (as shown in table 4.15), as reflected in the literature. As it was not the aim of the study to report on these correlations, these findings will not be interpreted here.

This section deals with correlations between the different constructs. The results will be reported and then interpreted.

The relationships between the different constructs will be discussed in table 4.15.

Table 4.15 Relationships between the different constructs

	Emotional Exhaustion (EX)	Depersonalisation (CY)	Professional Efficacy (PE)	Active Coping	Expressing Emotions	Turning to Religion	Seeking Social Support (SSSIR)	Denial	Acceptance	Behavioural Disengagement	Positive Reinterpretation & Growth	Restraint Coping	Suppression of Competing Activities	Comprehensibility	Manageability	Meaningfulness
Emotional Exhaustion (EX)	1	0,44 ⁺⁺	-0,09	-0,17 [*]	0,13	-0,10	-0,09	0,23 [*]	0,01	0,24 [*]	-0,22 [*]	-0,09	0,09	-0,44 ⁺⁺	-0,47 ⁺⁺	-0,42 [*]
Depersonalisation (CY)	-	1	-0,38 ⁺⁺	-0,17 [*]	0,11	0,02	-0,04	0,30 ⁺⁺	0,00	0,27 [*]	-0,11	-0,10	0,07	-0,38 ⁺⁺	-0,46 ⁺⁺	-0,56 [*]
Professional Efficacy (PE)	-	-	1	0,27 [*]	-0,03	0,02	0,05	-0,21 [*]	-0,04	-0,34 ⁺⁺	0,14	0,00	0,04	0,34 [*]	0,34 [*]	0,43 [*]
Active Coping	-	-	-	1	0,10	0,1	0,35 ⁺⁺	-0,29 [*]	0,13	-0,40 ⁺⁺	0,44 ⁺⁺	0,17 [*]	0,42 ⁺⁺	0,35 ⁺⁺	0,35 ⁺⁺	0,39 [*]
Expressing Emotions	-	-	-	-	1	0,20 [*]	0,47 ⁺⁺	0,09	0,07	0,06	0,07	0,03	0,03	-0,15	-0,13	-0,01
Turning to Religion	-	-	-	-	-	1	0,10	-0,00	0,07	0,11	0,20 [*]	0,21 [*]	0,02	0,02	0,06	0,15
Seeking Social Support (SSSIR)	-	-	-	-	-	-	1	-0,11	0,17 [*]	-0,09	0,29 [*]	0,07	0,21 [*]	0,13	0,21 [*]	0,24 [*]
Denial	-	-	-	-	-	-	-	1	0,08	0,42 ⁺⁺	-0,11	0,03	-0,06	-0,36 ⁺⁺	-0,45 ⁺⁺	-0,35 [*]
Acceptance	-	-	-	-	-	-	-	-	1	0,09	0,23 [*]	0,24 [*]	0,12	-0,03	0,05	0,03
Behavioural Disengagement	-	-	-	-	-	-	-	-	-	1	-0,19 [*]	0,04	-0,14	-0,40 ⁺⁺	-0,40 ⁺⁺	-0,43 [*]
Positive Reinterpretation & Growth	-	-	-	-	-	-	-	-	-	-	1	0,21 [*]	0,11	0,23 [*]	0,32 ⁺⁺	0,36 [*]
Restraint Coping	-	-	-	-	-	-	-	-	-	-	-	1	0,02	0,07	0,12	0,09
Suppression of Competing Activities	-	-	-	-	-	-	-	-	-	-	-	-	1	-0,05	-0,04	-0,04
Comprehensibility	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0,72 ^{##}	0,56 [*]
Manageability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0,67 [*]
Meaningfulness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Note: ^{*} p < 0,05 Statistically significant
⁺⁺ r > 0,30 Practically significant – medium effect
^{##} r > 0,50 Practically significant – large effect

Although most of the correlations between the variables were statistically significant ($p < 0,01$), some were of medium and large practical significance.

4.3.1.1 The relationship between the MBI questionnaire and the COPE questionnaire

Table 4.15 shows the following practically significant correlations between the MBI questionnaire and the COPE questionnaire:

Emotional Exhaustion correlates negatively (statistically significant) with Active Coping, meaning that the individual experiencing a reduction in emotional resources and feeling drained and used up, will not make an active attempt to remove or avoid the source of stress.

Emotional Exhaustion correlates positively (statistically significant) with Denial, meaning that the individual experiencing a reduction in emotional resources and feeling drained and used up, will also perceive the source of stress as unreal and therefore no active attempt is made at handling it.

Emotional Exhaustion correlates positively (statistically significant) with Behavioural Disengagement, meaning that the individual experiencing a reduction in emotional resources and feeling drained and used up, will also experience a feeling of helplessness when the individual stops all effort to handle the source of stress.

Emotional Exhaustion correlates negatively (statistically significant) with Positive Reinterpretation and Growth, meaning that the individual experiencing a reduction in emotional resources and feeling drained and used up, will also not attempt handling the upsetting emotions.

Depersonalisation correlates negatively (statistically significant) with Active Coping, meaning that the individual experiencing negative and cynical attitudes about work and colleagues, will also not make an active attempt to remove or avoid the source of stress.

Depersonalisation correlates positively (statistically significant – medium effect) with Denial, meaning that the individual experiencing negative and cynical attitudes about work and colleagues, will also perceive the source of stress as unreal and that no active effort is aimed at handling it.

Depersonalisation correlates positively (statistically significant) with Behavioural Disengagement, meaning that the individual experiencing negative and cynical attitudes about work and colleagues, will also experience a feeling of helplessness when the individual stops all effort to handle the source of stress.

Professional Efficacy correlates positively (statistically significant) with Active Coping, meaning that the individual experiencing feelings of competence and successful achievement in one's work, will also make an active attempt to remove, minimise or avoid the source of stress.

Professional Efficacy correlates negatively (statistically significant) with Denial, meaning that the individual experiencing feelings of competence and successful achievement in one's work, will not perceive the source of stress as unreal with no active effort at handling it.

Professional Efficacy correlates negatively (statistically significant – medium effect) with Behavioural Disengagement, meaning that the individual experiencing feelings of competence and successful achievement in one's work, will not experience a feeling of helplessness in trying to handle the source of stress.

Integration

It's evident that a strong relationship exists between the MBI questionnaire and the COPE questionnaire. Emotional Exhaustion correlates positively with Denial and Behavioural Disengagement. Both these two coping mechanisms are aimed at avoiding the source of stress or denying it. The individual feeling drained and used up will also take very little action to address the source of stress or simply deny it. Emotional Exhaustion correlates negatively with Active Coping and Positive Reinterpretation and Growth. Both these two coping mechanisms are aimed at actively addressing the source of stress.

Depersonalisation correlates positively with Denial and Behavioural Disengagement. Both these coping mechanisms are aimed at avoiding or denying the source of stress. The individual experiencing negative and cynical attitudes about work will therefore also take very little action to address the source of stress or just simply deny it. Depersonalisation correlates negatively with Active Coping which is aimed at actively trying to reduce or avoid the source of stress.

Professional Efficacy correlates positively with Active Coping, meaning that the individual experiencing feelings of successful achievement, will also actively attempt to remove or avoid the source of stress. Professional Efficacy correlates negatively with Denial and Behavioural Disengagement. Both these coping mechanisms are aimed at avoiding or denying the source of stress and experiencing a feeling of helplessness.

4.3.1.2 The relationship between the COPE questionnaire and the Sense of Coherence questionnaire

Table 4.15 shows the following practically significant correlations between the COPE questionnaire and the Sense of Coherence questionnaire:

Active Coping correlates positively (statistically significant – medium effect) with Comprehensibility, meaning that the individual making an active attempt to remove the source of stress will also experience life as making cognitive sense.

Active Coping correlates positively (statistically significant – medium effect) with Manageability, meaning that the individual making an active attempt to remove the source of stress will also perceive that the resources at one's disposal are adequate to meet the demands posed by the stimuli that bombarded one.

Active Coping correlates positively (statistically significant – medium effect) with Meaningfulness, meaning that the individual making an active attempt to remove the source of stress will also experience life as making sense emotionally.

Seeking Social Support correlates positively (statistically significant) with Manageability, meaning that the individual gathering advice, help and information to solve the problem, will also perceive stressors as manageable and therefore selecting appropriate resources.

Seeking Social Support correlates positively (statistically significant) with Meaningfulness, meaning that the individual gathering advice, help and information to solve the problem, will also experience life as a challenge and worthy of commitment.

Denial correlates negatively (statistically significant – medium effect) with Comprehensibility, meaning that the individual perceiving the source of stress as unreal and therefore making no effort to avoid handling it, will also view the internal and external environments as not making cognitive sense.

Denial correlates negatively (statistically significant – medium effect) with Manageability, meaning that the individual perceiving the source of stress as unreal and therefore making no effort to avoid handling it, will also perceive the resources available as inadequate to meet the demands posed by the stimuli.

Denial correlates negatively (statistically significant – medium effect) with Meaningfulness, meaning that the individual perceiving the source of stress as unreal and therefore making no effort to avoid handling it, will also experience life as not making sense emotionally.

Behavioural Disengagement correlates negatively (statistically significant – medium effect) with Comprehensibility, meaning that the individual experiencing a feeling of helplessness when all efforts are stopped to handle the stress, will also view the internal and external environments as not making cognitive sense.

Behavioural Disengagement correlates negatively (statistically significant – medium effect) with Manageability, meaning that the individual experiencing a feeling of helplessness when all efforts are stopped to handle the stress, will also perceive that the resources available are inadequate to meet the demands posed by the stimuli.

Behavioural Disengagement correlates negatively (statistically significant – medium effect) with Meaningfulness, meaning that the individual

experiencing a feeling of helplessness when all efforts are stopped to handle the stress, will also experience life as not making sense emotionally.

Positive Reinterpretation and Growth correlates positively (statistically significant) with Comprehensibility, meaning that the individual aiming at handling the upsetting emotions and not the source of stress per se, will also view the internal and external environments as making cognitive sense.

Positive Reinterpretation and Growth correlates positively (statistically significant – medium effect) with Manageability, meaning that the individual aiming at handling the upsetting emotions and not the source of stress per se, will also perceive the resources available as adequate to meet the demands posed by the stimuli.

Positive Reinterpretation and Growth correlates positively (statistically significant – medium effect) with Meaningfulness, meaning that the individual aiming at handling the upsetting emotions and not the source of stress per se, will also experience life as making sense emotionally.

Integration

It's evident that strong relationships exist between the COPE questionnaire and the Sense of Coherence questionnaire. Active Coping correlates positively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness. It is clear to see the strong correlation between the individual actively trying to remove or avoid the source of stress and the three components of the SOC. The individual with a strong SOC will therefore apply coping mechanisms aimed at addressing the source of stress.

Seeking Social Support correlates positively with both Manageability and Meaningfulness. Seeking Social Support is a coping mechanism similar to

Active Coping where an effort is made to address the source of stress. Seeking Social Support is aimed at gathering information and advice in order to solve the problem.

Denial correlates negatively with all three components of the SOC. It is evident that the individual with a low score on the SOC will perceive the source of stress as unreal and therefore attempt no effort to remove or handling it. Based on the correlations between the different constructs, it is clear that Active Coping is the direct opposite of Denial as coping mechanism.

Behavioural Disengagement could also be classified as the opposite of Active Coping based on the correlations between the constructs of this study. Behavioural correlates negatively with all three components of the SOC. The individual scoring low on the SOC will therefore experience a feeling of helplessness when all efforts are stopped to handle the source of stress.

Positive Reinterpretation and Growth correlates positively with all three components of the SOC. The individual aiming at handling the upsetting emotions and not the source of stress per se, will also score high on the three components of the SOC.

4.3.1.3 The relationship between the MBI questionnaire and the Sense of Coherence questionnaire

Table 4.15 shows the following practically significant correlations between the MBI questionnaire and the Sense of Coherence questionnaire:

Emotional Exhaustion correlates negatively (statistically significant – medium effect) with Comprehensibility, meaning that the individual feeling drained

and used up, will also experience the internal and external environments as not making cognitive sense.

Emotional Exhaustion correlates negatively (statistically significant – medium effect) with Manageability, meaning that the individual feeling drained and used up, will also perceive the resources available as inadequate to meet the demands posed by the stimuli.

Emotional Exhaustion correlates negatively (statistically significant – medium effect) with Meaningfulness, meaning that the individual feeling drained and used up, will also experience life as not making sense emotionally.

Depersonalisation correlates negatively (statistically significant – medium effect) with Comprehensibility, meaning that the individual experiencing negative and cynical attitudes toward work and colleagues, will also experience the internal and external environments as not making cognitive sense.

Depersonalisation correlates negatively (statistically significant – medium effect) with Manageability, meaning that the individual experiencing negative and cynical attitudes toward work and colleagues, will also perceive the resources available as inadequate to meet the demands posed by the stimuli.

Depersonalisation correlates negatively (statistically significant – large effect) with Meaningfulness, meaning that the individual experiencing negative and cynical attitudes toward work and colleagues, will also experience life as not making sense emotionally.

Professional Efficacy correlates positively (statistically significant – medium effect) with Comprehensibility, meaning that the individual experiencing

feelings of competence and successful achievement in one's work, will also experience the internal and external environments as making cognitive sense.

Professional Efficacy correlates positively (statistically significant – medium effect) with Manageability, meaning that the individual experiencing feelings of competence and successful achievement in one's work, will also perceive the resources available as adequate to meet the demands posed by the stimuli.

Professional Efficacy correlates positively (statistically significant – medium effect) with Meaningfulness, meaning that the individual experiencing feelings of competence and successful achievement in one's work, will also experience life as making sense emotionally.

Integration

The relationship between the MBI and the Sense of Coherence questionnaire indicates very insightful correlations. An individual experiencing high level of burnout will score high on the Emotional Exhaustion and Depersonalisation subscales and low on the Professional Efficacy subscale. The individual with a well developed sense of coherence will score high on all three components of the SOC. Both Emotional Exhaustion and Depersonalisation correlates negatively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness. Professional Efficacy correlates positively with all three components of the SOC. There is thus a direct correlation between the MBI and the SOC.

4.4 MULTIPLE CORRELATIONS

The multiple correlations for the MBI questionnaire, COPE questionnaire and the Sense of Coherence questionnaire are reported in table 4.16.

Table 4.16 Multiple correlations for the MBI, COPE and SOC

	First Canonical Variate		Second Canonical Variate	
Set 1	Correlation	Coefficient	Correlation	Coefficient
Sense of Coherence	-0,98 *	-0,88 *	-0,04	-0,30
Active Coping	-0,42 *	-0,01	0,58 *	0,63
Expressing Emotions	0,18	0,05	0,25	0,23
Turning to Religion	-0,08	-0,03	0,14	0,21
Seeking Social Support (SSSIR)	-0,13	0,05	0,05	-0,23
Denial	0,50 *	0,04	0,14	0,41
Acceptance	0,03	0,04	-0,14	-0,13
Behavioural Disengagement	0,57 *	0,15	-0,50 *	-0,56 *
Positive Reinterpretation & Growth	-0,34 *	-0,02	0,20	0,07
Restraint Coping	-0,13	-0,05	-0,32	-0,40
Suppression of Competing Activities	0,09	0,05	0,40	0,12
Percent of Variance	0,17		0,09	Total = 0,26
Redundancy	0,08		0,00	Total = 0,08
Set 2	Correlation	Coefficient	Correlation	Coefficient
Emotional Exhaustion (Ex)	0,76 *	0,56 *	0,27	0,00
Depersonalisation (Cy)	0,79 *	0,37	0,42	0,79 *
Professional Efficacy (PE)	-0,64 *	-0,45	0,68 *	0,98 *
Percent of Variance	0,54 *		0,24	Total = 0,78
Redundancy	0,24		0,01	Total = 0,25
Canonical Correlation	0,67 *		0,23	
Squared Canonical Correlation	45% *		5%	

According to table 4.16, the first canonical correlation could be reported as 0,67 and the second canonical correlation as 0,23. The cut-off correlation for table 4.16 is 0,30. With the cut-off correlation of 0,30 the variables of the first set (Sense of Coherence and COPE) that correlated with the first canonical variate were Sense of Coherence (-0,98), Active Coping (-0,42), Denial (0,50), Behavioural Disengagement (0,57) and Positive Reinterpretation and Growth (-0,34). Variables in the second set (MBI) that correlated with the first canonical variate were Emotional Exhaustion (0,76), Depersonalisation (0,79) and Professional Efficacy (-0,64). The first pair of canonical variates indicates that Sense of Coherence (-0,98), Active Coping (-0,42), Denial (0,50), Behavioural Disengagement (0,57) and Positive Reinterpretation and growth (-0,34) correlate with high levels of Emotional Exhaustion (0,76), Depersonalisation (0,79) and Professional Efficacy (-0,64). It is evident that there is a significant correlation between the three components of the MBI and the SOC, Active Coping, Denial, Behavioural Disengagement and Positive Reinterpretation and Growth. The individual scoring high on the two MBI dimensions, namely Emotional Exhaustion and Depersonalisation will also score high on Denial and Behavioural Disengagement. The individual scoring high on the third component of the MBI, namely, Professional Efficacy will also score high on the SOC, Active Coping and Positive Reinterpretation and Growth.

According to table 4.16, it is evident that the null hypothesis of no correlation between burnout, coping and sense of coherence can be rejected in favour of the alternative. It can thus be inferred that burnout, coping and sense of coherence are significantly related.

4.5 INTEGRATION OF THE LITERATURE REVIEW WITH THE EMPIRICAL FINDINGS

The empirical study provided information on burnout, coping and sense of coherence within this sample. The purpose of this section is to integrate the

significant findings of the empirical study with the findings of the literature review discussed in chapters 2 and 3.

Based on the standardised categorisation of burnout levels for sub-scale scores proposed by Maslach and Jackson (1986), the sample in this study experienced relatively low to moderate levels of burnout on the Emotional Exhaustion sub-scale, relatively low to moderate levels of Depersonalisation and relatively high levels of Personal Accomplishment. According to Maslach and Jackson (1986), a low degree of burnout is reflected in low scores on the Emotional Exhaustion and Depersonalisation subscales and in high scores on the personal Accomplishment subscale. The average employee in the study would therefore not feel drained and used up (emotional exhaustion), nor have negative, cynical and insensitive attitudes towards work, colleagues and clients (depersonalisation), nor experience a feeling of being unable to meet others' needs or to satisfy essential elements of job performance (Maslach et al., 1996). The sample experienced relatively high levels of personal accomplishment. In general, they feel that they are able to satisfy essential elements of job performance and that they are able to meet others' needs. A lower level of personal accomplishment would have indicated feelings of insufficient recognition for the job employees do as well as feelings about the limited scope of work and a lack of challenging projects.

Regarding coping strategies, the sample was found to score the highest on active coping, expressing emotions, acceptance, seeking social support and turning to religion. The sample scored the lowest on behavioural disengagement, denial, restraint coping and suppression of competing activities. The mean score for Active Coping (25,69) is significantly higher than the other scores on other coping dimensions. This is indicative that the average person in the sample would take active attempts to remove the source of stress, to minimise the effect thereof, or to avoid the source of stress.

The coping mechanism least used by the sample is Behavioural Disengagement with a score of 6,22. Behavioural Disengagement as a coping mechanism occurs when an individual experiences a feeling of helplessness and stops all effort to handle the source of stress. Behavioural Disengagement as a coping mechanism could therefore be described as the opposite of Active Coping where the individual initiates direct action, increasing his or her efforts, and tries to execute a coping attempt in stepwise fashion.

The mean scores for the Sense of Coherence questionnaire vary between 43,35 (meaningfulness) and 50,29 (Manageability). The total score for the Sense of Coherence questionnaire in this sample is 140,48, with a standard deviation of 22,16. A strong sense of coherence is promoted by life experiences which are the results of generalised resistance resources (Antonovsky, 1987). A high score on comprehensibility indicates that an individual senses life as ordered and consistent. A high score on meaningfulness indicates that an individual sees life as a challenge and not as a burden. Manageability describes an individual's ability to perceive stressors as manageable.

Engineers and scientists with a strong sense of coherence will experience less burnout. This is so because the stronger the sense of coherence, the greater the tendency to identify the nature of the stressor confronted and to select the appropriate resources for the given situation. More specifically, the findings indicate that a weak sense of coherence is strongly related to emotional exhaustion. Engineers and scientists who do not experience events in life as manageable, who do not perceive stimuli from the environment as ordered and structured and do not feel that life is making sense, tend to experience a reduction in their emotional resources and feel emotionally drained. These components are also related to negative, cynical and insensitive attitudes towards colleagues, clients and/or

subordinates. Engineers and scientists with a strong Sense of Coherence will use the appropriate coping mechanism to effectively reduce or eliminate the source of stress. Active Coping as a coping mechanism will therefore be used on a regular basis by people with a strong SOC who experience life as ordered, consistent and perceive stressors as manageable. An individual with a strong SOC will experience life as a challenge, as worthy of commitment.

Engineers and Scientists with a weak Sense of Coherence will experience life as accidental and cognitively not understandable. A weak SOC will have the implication that an individual will not be able to select the appropriate resources, those under one's own control, available from others, or from a legitimate authority, such as God. This individual will react with helplessness. Behavioural Disengagement as a coping mechanism will be the mechanism used by people with a weak SOC. Behavioural Disengagement usually follows a feeling of helplessness, when the individual stops all effort to handle the source of stress. This will lead to high levels of Emotional Exhaustion where an individual will experience a reduction in emotional resources, feeling drained and used up. It will also lead to high levels of Depersonalisation where the individual will increasingly experience negative, cynical and insensitive attitudes towards work itself, colleagues or clients. A lack of personal accomplishment will be experienced by this individual, with a feeling of being unable to meet others' needs and to satisfy essential elements of job performance. Experiences that are characterised by unpredictability, uncontrollability and uncertainty will lead to a weak sense of coherence. The individual's inability to deal with stress can lead to organisational effects which include absenteeism, poor productivity, poor interpersonal relationships at work and high levels of job dissatisfaction (Cox, 1978; Levi, 1982).

From the empirical results it is clear that there is a definite correlation between burnout and sense of coherence. The higher SOC individual will use the appropriate coping mechanism, which will counter burnout. The three sub-elements of Sense of Coherence have a major influence on how people manage stress and stay well (Antonovsky, 1979). Engineers and scientists with a strong Sense of Coherence experience less exhaustion because stimuli from the environment are perceived as making cognitive sense, as being under the control of both the individual and legitimate others and as motivationally relevant and meaningful. Burnout results when individuals fail to acquire sufficient resources. Two interpretations are possible of the relationship between a weak Sense of Coherence and burnout. Firstly, individuals with better and more resources are less vulnerable to resource loss and more inclined to obtain better resources. Conversely, those with fewer resources are more vulnerable to resource loss and are less able to obtain resources. Sense of Coherence, according to Antonovsky (1987), is regarded as a broad-band resource, while burnout could be the result of a lack of resources. It is also possible, according to Antonovsky (1987), that the Sense of Coherence of individuals weakens because of burnout.

It seems likely that a strong Sense of Coherence could provide protection against burnout because it starts developing early in life outside the work environment, and burnout sets in only after an individual has been employed for some length of time (Strümpfer, 1990). A tentative conclusion is that Sense of Coherence, which is regarded as a "meaning-providing variable" (Strümpfer, 2002), may assist in the warding-off of burnout. Individuals with a strong Sense of Coherence could also experience burnout but will, in the long term, probably benefit even from that. They are likely to use the temporary condition of anguish as an opportunity for growth and for resolving pre-existing and present problems, for reorganising their life and work circumstances, and for going forward with newly discovered skills and perspectives on self and life (Strümpfer, 2002).

4.6 CHAPTER SUMMARY

Step 6 of the empirical investigation was discussed in this chapter. This step included reporting and interpreting the results, followed by an integration of the results. The last three steps (steps 7-9) of the empirical study, namely, the conclusions, limitations and recommendations, will be discussed in chapter 5.

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter will focus on steps 7-9 of the empirical study. Conclusions will first be drawn, followed by a discussion of the limitations. Finally, certain recommendations will be made.

5.1 CONCLUSIONS

The focus of this dissertation was to investigate the relationship between burnout, coping and salutogenesis. Research conclusions stemming from the literature review and the empirical study for each of the research aims, as stated in section 1.4 in chapter 1, will be formulated below.

5.1.1 Literature review

The specific literature aim was to investigate the theoretical relationship between burnout, coping and sense of coherence. This aim was achieved by means of the literature review regarding burnout, coping and sense of coherence in chapter 2.

Burnout was conceptualised from the literature as a syndrome of emotional exhaustion, depersonalisation, and reduced personal accomplishment. Individuals who experience emotional exhaustion feel drained or used up, feel physically fatigued and also a reduction in their emotional resources. Depersonalisation refers to an increase in negative, cynical and insensitive attitudes towards colleagues, clients and /or patients, while low personal accomplishment refers to a feeling of being unable to meet clients' needs and to satisfy essential elements of job performance. The burned out person's behaviour and motivation may also be influenced. This implies that the burnt-out person can be irritable, oversensitive and unemotional. The

individual feels helpless, hopeless and powerless, experiences negative and pessimistic feelings and could develop a poor personal or job-related self-esteem. Burnout could also result in physical distress, psychosomatic disorders and physiological reactions. Situational factors, personality dispositions or a combination thereof could be the cause of burnout.

Coping was defined by Lazarus and Folkman (1984) as an individual constantly changing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person. Coping was described in terms of problem-focused and emotion-focused strategies. The former include cognitive and behavioural strategies to deal with the stressor or stressful situation itself, and the latter encompass strategies to deal with the inherent negative emotions or distress.

Sense of Coherence was defined by Antonovsky (1987) as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that the stimuli deriving from one's internal and external environments in the course of living are structured, predictable and explicable; that the resources are available to one to meet the demands posed by these stimuli; and that these demands are challenges, worthy of investment and engagement. Comprehensibility, manageability and meaningfulness are the three core components of Sense of Coherence.

After a study of the literature it was found that a theoretical relationship does exist between burnout, coping and sense of coherence. Burnout symptoms surface when the individual has a weak sense of coherence and cannot apply the relevant coping mechanisms in order to remove or avoid the source of stress. Individuals with a strong sense of coherence will experience less burnout. The stronger the sense of coherence, the greater the tendency

to identify the nature of the stressor confronted and select the appropriate resources for the given situation. Individuals with a strong sense of coherence have the ability to evaluate the nature of the stressor and to apply the appropriate coping mechanism to deal with the stressor or to avoid it.

5.1.2 Empirical study

The objective was to determine the nature of the relationship between burnout, coping and sense of coherence. This was achieved in chapter 4 by means of the reporting, interpretation and integration of the results. The following conclusions can be drawn from these results:

- (a) Emotional Exhaustion correlates positively with Denial and Behavioural Disengagement. Emotional Exhaustion correlates negatively with Active Coping and Positive Reinterpretation and Growth.
- (b) Depersonalisation correlates positively with Denial and Behavioural Disengagement. Depersonalisation correlates negatively with Active Coping.
- (c) Professional Efficacy correlates positively with Active Coping. Professional Efficacy correlates negatively with Denial and Behavioural Disengagement.
- (d) Active Coping correlates positively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness.
- (e) Seeking Social Support correlates positively with Manageability and Meaningfulness.
- (f) Denial correlates negatively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness.
- (g) Behavioural Disengagement correlates negatively with Comprehensibility, Manageability and Meaningfulness.
- (h) Positive Reinterpretation and Growth correlates positively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness.

- (i) Emotional Exhaustion correlates negatively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness.
- (j) Depersonalisation correlates negatively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness.
- (k) Professional Efficacy correlates positively with all three components of the SOC, namely, Comprehensibility, Manageability and Meaningfulness.

It is evident that strong relations exist between the components of the MBI, COPE and SOC. It can thus be inferred that burnout, coping and sense of coherence are significantly related.

5.2 LIMITATIONS OF THE RESEARCH

The limitations of the research are discussed with regard to the literature review and the empirical study.

5.2.1 Literature review

The following limitations were encountered in the literature review:

- (a) Studies on the relationship between burnout (MBI), coping and sense of coherence seem to be few. The lack of such information therefore limited the researcher in determining a theoretical relationship.
- (b) Studies on the MBI-GS dimensions (exhaustion, cynicism, professional efficacy) also seem to be few, although there are a wide variety of literature studies on the MBI-HSS dimensions of burnout (emotional exhaustion, depersonalisation, personal accomplishment).
- (c) A wide variety of burnout models exists in the literature, which made it difficult to decide on the most suitable model to use in this study.

(d) There is a limited amount of literature on the South African context of the relationship between burnout, coping and sense of coherence.

5.2.2 Empirical study

(a) The most serious limitation is the reliance on cross-sectional perceptual measures. Data collected through self-report measures at one point in time have the potential to inflate the observed relationships spuriously, introducing what is termed *common method variance*.

(b) The sample size was relatively small, which implies that these findings cannot be generalised to the whole company, the engineering and/or scientific industry, nor to other industries.

(c) Only one psychometric instrument for each factor was used to measure burnout, coping and sense of coherence. The use of other psychometric instruments on burnout, coping and sense of coherence could have furnished more insight into burnout, coping and sense of coherence.

(d) The sample represented a limited work setting and industry, with the total sample working for the same company. The inclusion of other companies and industries could have added more useful data.

5.3 RECOMMENDATIONS FOR FUTURE RESEARCH

Against the background of the aforementioned conclusions and limitations, the following recommendations can be formulated regarding further research into burnout, coping and sense of coherence:

(a) The relationship between burnout, coping mechanisms and sense of coherence should be investigated in a wider variety of organisations, using

larger samples.

(b) Future research regarding burnout could also include the relationship between burnout and personality traits.

(c) The results of this study suggest that future research is warranted at both the individual and the organisational level, to better understand the antecedents and correlates of burnout.

(d) Research is also needed regarding burnout and its possible correlates in other organisational contexts, such as consulting, operations and research environments.

(e) The influence of biographical characteristics such as age, gender and work experience on burnout must be further researched.

(f) Future research should also focus on individual and organisational factors related to the emotional exhaustion, depersonalisation and lack of personal accomplishment of engineers and scientists in technology companies.

(g) Research is also needed regarding burnout and its possible correlates in other organisational contexts, such as internationally based engineers and scientists, other business units and different careers and professions.

5.4 CHAPTER SUMMARY

The aim of this research was to determine a relationship between burnout, coping and sense of coherence. Based on the research findings, conclusions and limitations were reported. This chapter concluded with a few recommendations. This concludes steps 7-9 of the empirical study.

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