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AN ANALYSIS OF THE RELATIONSHIP BETWEEN COPING STRATEGIES USED AND INCIDENCE OF RELAPSE IN MYALGIC ENCEPHALOMYELITIS

Anne-Marie Biccard

A Dissertation Submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, for the degree of Master of Science.

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ABSTRACT

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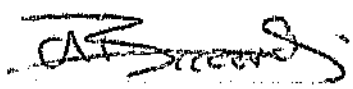
This dissertation studies the relationship between the use of certain coping strategies and the relapse of illness. Eighty subjects with Myalgic Encephalomyelitis (M.E.) were followed over a nine month period, initially completing a biographical questionnaire which showed some interesting common features, but these characteristics may be attributed to the narrow population from which the sample was drawn. The subjects then completed a battery of tests every eight weeks. These tests monitored appraisal of stressors, ways of coping and general health over the eight weeks since the previous test. Results were analysed using a Pearson's product moment correlation and a principal components factor analysis with a varimax rotation. The subjects were expected to show a positive correlation between certain coping techniques (such as denial, avoidance, and self- blame) and the relapse of M.E., while a zero or negative correlation between other coping techniques (such as seeking social support and problem solving when the stressor is controllable) and relapse. Neither of these hypotheses was supported by the data gathered. However, the subjects showed a remarkable consistency in the types of coping used, rather than adapting the mode of coping to the type of stressor experienced.

It was concluded that the subjects used abnormal coping techniques and that these techniques were somehow related to their illness. However, the exact causal relationship between the coping techniques and the illness could not be assessed. It is possible that the subjects' poor coping mechanisms contributed to the development and exacerbation

of the illness but it is also possible that the illness limited the repertoire of coping techniques available to the patient.

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the degree of Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University, nor has it been prepared under the aegis or with the assistance of any other body or organisation or person outside the University of the Witwatersrand, Johannesburg.



Anne-Marie Biccard

08 day of 02 , 1994

PREFACE

Currently, medicine and psychology occupy separate camps in the investigation of illness. Most research is physiological or psychological, with a few holistic thinkers attempting to amalgamate the two. This thesis approaches the subject from an integrated perspective, proposing that state of mind and ways of dealing with the world are vital components of the disease process. Looking specifically at coping techniques, the study attempts to access the relationship between the individual's appraisal of the stressor, the ways of dealing with it and the impact of these factors on the individual's health. In addition, diseases like Myalgic Encephalomyelitis need to be investigated and the dismissive attitude towards psychosomatic illnesses must be redressed.

Sincere thanks are extended to the following people:

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Elisa Galgut for editorial and personal support.

Throughout the text, the feminine form is used. This does not imply any prejudice on the part of the writer; for the sake of convenience, one form had to be selected and the feminine was more relevant given the fact that the subjects of the study were all female. However, any remarks can be considered equally applicable to the masculine gender unless otherwise specified.

"I must go back where all the ladders start;
To the foul rag and bone shop of the heart"

-W.B. Yeats

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INTRODUCTION

This study focuses on the relationship between stress, coping and illness. It is postulated that a psychophysiological pattern is set up when the individual is exposed to distressing circumstances. An attempt is made to gain some insight into the relationship between the individual's perception of the event as negative, the attempts to ameliorate the event through coping and the individual's resulting state of health. Insight into this relationship would lead to a better understanding of the many diseases which are currently believed to be stress-related. It would also cast some light onto the complex relationship between the mind and the body.

Recent research finds a myriad of psychological, social and environmental factors involved in the stress response. These factors either enhance or retard the progress of the physiological response and may mitigate against, or exacerbate, the advent of disease. The brain can be seen as a nexus of pathways that receive, evaluate, process, store and act on physical occurrences in the environment as well as aspects within the individual. Biological research has put forward many postulates on how the individual adapts and reacts to these stimuli, but behavioural scientists and physiologists have yet to settle on a design incorporating all the factors which influence the individual in the environment. Nevertheless, it can be postulated that this design is structured in order to enable us to manipulate all the variables that impinge on us in the present, as well as all the experiences which come with us from the past, and still maintain the homeostasis that Cannon observed in 1939. It is when we can no longer maintain the balance that the classic symptoms of stress become apparent. It is not a leap of faith, therefore, to expect to find the mind and body working together as a unit in the maintenance of health.

This study explores the relationship between the individual's perceptions and her state of health, moving away from the linear notion of "one germ, one disease, one cure" and trying to see health and disease in more holistic terms. The study investigates a group of eighty women, between the ages of sixteen and sixty, with Myalgic Encephalomyelitis (M.E.). Their perceptions of stress, ways of coping and general health were monitored over a nine month period. Some insight into stressful life events was also sought, but

the emphasis did not fall on stressful life events before the onset of the illness. Literature warns against retrospectively testing premorbid events, referring to it as "effort after meaning" (Fisher and Reason, 1988). Subjects tend to over-report the impact of life events and post-morbid depression may bias recall in favour of unhappy events.

Commencing with the literature review, the theoretical framework adopted as the foundation for this study is outlined. Mention will be made of alternative approaches but the fundamental theoretical approach sees the individual's cognitive perceptions of the stressor as the central issue. Following the review of literature on the stress response itself, a summary of recent research into the connection between stress and illness will be presented and certain theories of coping will be outlined as possible methods of intervention between stress and illness.

There are three reasons for choosing to study M.E. as opposed to any other illness. Firstly, the cyclical nature of M.E., with an unpredictable pattern of recovery and relapse, makes it easier to monitor the effects of certain coping behaviours on the progression of the disease once the diagnosis has been made. Secondly, the argument concerning the psychosomatic nature of the illness is a fascinating one and lends itself to the investigation of the mind-body connection. Lastly, this illness has come to the fore at the same time as AIDS and has therefore suffered a lack of attention, funds and research; probably because it is not known to be terminal. It is, however, quiet debilitating, and effects people in their most economically productive years. It is estimated by the Nightingale Research foundation that there are at least 300 000 people who are unemployed as a result of M.E. in the United States. This figure cannot be ignored and any insight into the cause and progression of the disease, for example the use of maladaptive coping mechanisms, will help thousands of sufferers and contribute to research on M.E. as well as research into the relationship between stress and disease.

A problem with the selection of M.E. as the illness to be studied is that it has become a slot into which many doctors put 'problem patients'; especially those with illnesses that do not respond to treatment. The result of this is that there are numerous indi-

viduals who have been diagnosed with M.E. who do not actually have the syndrome as it is defined by leading authorities. Including these individuals in the sample would create a bias, so there has been an attempt to screen them out by only using subjects accessed through doctors, so that physiological diagnostic tests will have been done.

MYALGIC ENCEPHALOMYELITIS

Introduction

A controversy rages around the topic of encephalomyelitis - whether it is a virus, a psychiatric disease or some sort of psychosomatic ailment resulting from our Westernised way of life. Researchers cannot even concur on a name for it - it has been called Chronic Fatigue Syndrome, Icelandic disease, Tapanui 'flu, Yuppie 'flu, Epidemic neuromyesthenia, Royal Free disease and Post Viral Fatigue System. The currently accepted name is Myalgic Encephalomyelitis - a name which describes the syndrome in itself, with 'myalgic' denoting the muscle pain, 'encephalo' meaning 'affecting the brain' and myelitis meaning 'affecting the nerves'. It seems that M.E. does not have a cardinal symptom which sets it aside diagnostically from other illnesses. Perhaps this is why it has been misdiagnosed repeatedly over the last forty years. The most consistently reported symptom is persistent fatigue and muscle pain, but this is not solely an indicator of M.E. and is reported by people suffering from a multitude of other viral complaints. It is possible that M.E. will not be recognised as a bona fide illness until such a feature is isolated and can be used to classify the disease. Another obstacle preventing the recognition of the disease is that two thirds of the sufferers are female. Unfortunately, this has lead to a trivialisation of the illness with intimations of hysteria and psychosomatic syndromes in some circles.

Brief History and Current Research

The first recorded outbreak of M.E. was in Los Angeles in 1934. 198 staff members became ill at the L.A. County General Hospital and six months after the epidemic peak 50 of the staff were still unable to work (Macintyre, 1988). Interestingly, this epidemic followed a massive polio outbreak with 1 301 cases in the L.A. County General Hospital alone. The fact that the staff, rather than the patients, were at a much higher risk is something which is repeated in many of the other 52 recorded outbreaks worldwide, most notably in the Royal Free Hospital outbreak of 1955. This supports the hypothesis that vulnerability to M.E. may be effected by the stresses present in the individual's life at the time of exposure to the virus. Interestingly, medical research has found many

similarities between the onset and progression of M.E. and Poliomyelitis - one similarity that I have not seen documented is that Polio also followed a more severe course if the sufferer exercised or was stressed during the ten day incubation period.

In 1970 Dr McEvedy and Dr Beard, psychiatrists at Middlesex hospital, London, published two papers in the British Medical Journal claiming that M.E. was a product of "mass hysteria" and was "all in the mind" (MacIntyre, 1988). Although many important issues have been raised disputing this claim, the suggestion was accepted by many people perhaps for reasons of convenience -it is less expensive and less threatening to believe that M.E. is "all in the mind" than to consider it a "bona fide disease".

In terms of the clinical picture of M.E., it usually follows a viral infection of some kind but, rather than recovering, patients continue to suffer from a variety of apparently unrelated symptoms. Exhaustion is the most commonly reported symptom - patients are unable to recover from any form of exertion - and severe muscle pain after any exercise is usually reported. Gastro-intestinal and respiratory problems are frequently reported, as are sensory disturbances such as paraesthesia, tinnitus and defective visual accommodation. Mental functioning is almost always effected, with marked impairment in short-term memory, motor function and concentration. The severity of disability varies considerably, but sufferers may be unable to continue to work or function at a level which they find acceptable. This disability is a confounding variable in terms of psychological research because it is very difficult to determine whether the depression and anxiety which is prevalent amongst sufferers is a secondary function of the disease or was a pre-morbid factor which may have contributed to the onset of M.E.

An investigation into the current research on M.E. revealed numerous theories but very little conclusive evidence. A full summary of the research is beyond the scope of this chapter, but a widely accepted study by Prof. James Mowbray at St. Mary's Medical School, London, it was found that 51% of M.E. sufferers were positive for the VP1 polypeptide (an enterovirus). Of those M.E. sufferers who were negative on the VP1 test, just over half (i.e. about 20% of the original population) were positive for an

Epstein Barr virus and the remaining 25% had no detectable virus in their bloodstream. The Nightingale Research Foundation suggests that the illness may be caused by a fragment of a virus, too small to cause a proper immune response and thus never giving the body the chance to really fight it. This may be related to the recent discovery that M.E. patients may have higher than normal levels of interferon in their bloodstreams. Interferon is a lymphokine - an member of the 'white blood cell army' and high levels are associated with a persisting infection. In fact, it is these lymphokines which cause the discomfort of illness, rather than the presence of the virus itself in the cells. Interferon is particularly well-known for causing depression, fatigue, muscle pains and 'flu-like symptoms - the cardinal features of M.E. Recent research has also found abnormal neurological, metabolic and haematological processes in M.E. sufferers. The hypothesis that the illness is caused by an infectious agent is supported by the fact that 1 in 4 M.E. sufferers have a colleague or relative with the virus (Macintyre, 1989). Of course, this figure may be explained by geneticists as a genetic predisposition and by environmentalists as suggesting that there is a stressor in the common environment which is responsible. Investigations into ionising and electromagnetic radiation, the effects of pesticides and the chemical pollution in our soil, air, water and food have been done (Macintyre, 1989; Shepherd, 1989), but no convincing evidence has come to light. Dieticians have suggested that M.E. may be caused by dietary deficiencies - levels of amino acids, vitamins A, B and C, essential fatty acids and zinc have all been monitored, but no conclusive findings have been reported.

It is thought by many theorists that both acute and prolonged stress may play a part in the onset and prognosis of M.E. (Macintyre, 1989; Shepherd, 1989) but the exact relationship is not clear. It may weaken the immunity system, cause hormonal change or cause changes on a cellular level, thereby interfering with the metabolism of the cell.

<u>In Response to Hysteria</u>

The article written by psychiatrists McEverdy and Beard (1970) has had a marked influence on the perception of M.E. and on its validity as a physiological disease. Their postulation that M.E. is the result of a mass hysteria was, and still is, accepted by many

medical professionals. For this reason, I feel that it is necessary to comment on the psychological theory behind the 'hysterical personality', so that the possible validity of these claims can be investigated.

The concept of the hysterical personality was initially developed in the psychoanalytic studies of hysterical neurosis. The origin of the word is with the root "hysteris" (uterus) and was initially coined meaning wandering uterus. An ideal typology of the hysterical style was developed, although very few individuals will fulfil all the criteria. The main symptoms of hysterical neurosis included either conversion reactions or dissociative episodes (Janet, 1909, in Horowitz, 1986) - both of these being related to the repression of ideas and emotions which would be intolerable if they were to gain access to the conscious mind. In classic analytic theory, the emotions centre around the love feelings directed towards a symbolically incestuous object - these feelings are not morally acceptable and feelings of guilt and fear are experienced. There is the continuous threat that the feelings, which are being repressed and denied, will gain access to the individual's consciousness; this predisposes the individual towards developing conversion reactions, anxiety attacks and/or dissociative episodes. Horowitz (1986) points out that, because of a tendency to act out oedipal fantasies, the hysterical character is more susceptible to stress response syndromes after seductions, loss of persons or positions which provided direct or symbolic love, after loss of disfigurement of body parts or attributes which are thought to make the individual more attractive to others, and after guilt associated with a personal activity. In addition, any event which elicits strong emotions, such as erotic excitement, anger, guilt, anxiety or shame is more than usually stressful. In terms of their cognitive style, hysterics are characterised by a lack of sharp focus of attention and the tendency to arrive quickly at a global but superficial assumptions (Shapiro, in Horowitz, 1986). Traits include attention-seeking behaviours in the interview setting, rapid changes in mood and emotion and inconsistency of apparent attitudes. Interpersonal relationships may be dramatic and characterised by repetitive, impulsive relationships, often following victim-aggressor or child-parent themes. Theoretically, there may be a link between these postulations and the reactions of M.E. sufferers to stress, but claims that M.E. sufferers are actually hysterical personalities are

difficult to validate. No data on the pre-morbid personalities of the sufferers is available, and the idea that epidemics are simply outbreaks of mass hysteria takes no cognizance of the numerous endemic cases which occur throughout the western world. Although each initial interview at the outset of the study is reasonably detailed, it cannot claim to gain access to the individual's psyche and therefore will not comment on the psychodynamic world of the subject. Impressions made during the interview will be noted, but will not be included in the statistical analysis of the results. It is not believed that McEverdy and Beard's response does justice to both the physical and mental components of the disease, but the nature of this study prevents it from being used as a springboard to support or critique their position.

Summary

The search for a single 'cause' for M.E. has not been conclusive, perhaps because M.E. may be a syndrome rather than one specific virus. Twenty years ago, no organic basis for Multiple Sclerosis could be found and victims were labelled as neurotic or hysterical. Current medical science recognises it as a real disease, although no single test has been devised to diagnose it. In the same vein, the diagnosis of M.E. relies to a large extent on the clinical presentation of the disease and the history of the patient.

Looking at the histories of the individual patients themselves, there appears to be a common factor in that many of them were healthy, high-functioning adults before they contracted M.E. The name "Yuppie 'Flu" was coined by the media because M.E. is prevalent amongst people in responsible jobs - who function under stress and extend themselves both physically and mentally. I would propose that there are important factors in these people's lifestyles which places them at a greater risk for contracting M.E. These factors may be related to the conditions which seem to precipitate a relapse in a recovering M.E. patient. The foremost cause for relapse is physical exercise, followed closely be emotional stress and major changes in environment (for example moving, marriage, change of jobs). Other factors which place both physical and emotional strain on the individual, such as surgery, dental treatment, sudden changes in climate and exposure to chemicals, all seem to be instrumental in causing a relapse. As

will be seen from the chapter on stress theory, it is believed that the individual's perceptions of these events are more important than the events themselves.

MODELS OF STRESS

Introduction

The dynamics of stress are so complex that they virtually encompass the dynamics of life. In fact, constant challenge and adaptation in order to survive is a characteristic which is central to all living things. Before an assessment of coping strategies and their role in the stress process and the advent of disease is attempted, a comprehensive bio-social-psychological must be accepted as an anchor for the research. Assessments made will depend on which theoretical perspective is adopted, as will understandings of the causal relationships between the stressor, the coping strategies and the stress process as a whole.

The first problem in working with the concept of stress is a semantic one. In the literature, the term 'stress' has been very broadly used, covering a variety of concepts in many different contexts. 'Stress' can refer to an adaptive process, a cause for a range of diseases, or a disorder in itself. It can refer to independent, dependant or intervening variables in the interaction loosely described as living. The divisions between the various conceptual sets regarding the nature of health and illness have not served to clarify the definition of stress. Physiologists and behavioural scientists find it difficult to agree on a language in which to define stress, let alone all the underlying issues which come together in the formation of a definition. Certain occurrences (such as a promotion at work) can be seen as either a challenge or a stress, depending on all the other things which are happening, and which have happened in the past, for that individual.

Then there is the issue of defining whether a stress has negative or positive consequences. The short-term consequences may differ vastly from the long-term consequence of the same event, and the very act of classifying consequences as positive or negative involves a subjective value judgement on the part of the researcher.

The Transactional Model

At the outset of stress research, theorists attempted to understand and describe the stress process from their own perspective, with little or no inter-disciplinary references. This proved to be limited, however, as the stress process is multifaceted and the feedback loops existing between the physiological, psychological and social are too central to be ignored. Much research defines stress as a response to certain external or internal stimuli, but this definition implies that the nature of the stimuli which will induce stress is consistent. This is not the case - aside from certain physical conditions, such as extreme temperature changes or pain, there is no reliable way in which to predict whether an environmental stimulus will cause a physiological stress response. This problem may be largely a result of the subjectivity of the stress response and will not be easily overcome as subjectivity is a vital part of the human condition which we are attempting to study. Due to problems such as these, response-based and situational-based approaches have been abandoned as unidimensional (McGrath, 1970); they underestimate the importance of the individual's perception of the stressor and the feedback loops which exist between perceptions and coping resources. For this reason, I propose to use Cox's (1978), Lazarus's (1966; 1967; Coyne & Lazarus 1980) and Chalmers's (1981) (all cited in Chalmers, 1981) models of the stress process, all of which are transactional. They postulate that environmental demands, cognitive appraisals and emotional responses all interact reciprocally, so that stress is not perceived as a linear function or a simple stimulus-demand interaction. Also, the transactions must be understood both within their context and over time so that the totality of the individual's transactions with her environment are understood.

Lazarus (1981) (cited in Chalmers, 1981) restricts his definition of psychological stress to demands that exceed resources as cognitively appraised by the individual. This reflects the move in stress research towards recognising the importance of the individual's perception of the stressor and assists in explaining why different individuals react differently to stresses which appear to the observer to be of the same magnitude. This definition leads to the conception of coping as a means of bridging the discrepancy between demand and capacity. If this is the case, efforts at stress reduction must be aimed at

reducing the actual stress in the environment or increasing the individual's capacity to deal with the stressor. But another possibility exists - that the individual alters her perception of the significance of stressor, of the demand that it is making or of her own capacity. If this possibility did not exist, the relationship between stress experienced, coping strategies used and outcome would be far more simple. However, it is the perception of the stressor and the self within the environment that makes the stress response the enigma that it currently is. If a simple diagram showing the reciprocal relationship between potential activators, reactions, consequences and mediators is drawn it can be seen that the mediators and/or feedback loops are perhaps the most important aspect as they have an effect on all the other variables in the relationship. It should be noted that, although no agreement has been reached as to the nature of the stress response itself, almost all researchers in this area seem to accept a relational, interactional or transactional view of stress and to describe stress as a process rather than an outcome. There is also an acknowledgement of the multilevel, multitemporal nature of stress (Appley, 1987).

Personality factors

As the physicist takes the nature of the material into account in calculating the stress and strain experienced, so the psychologist must consider the personality of the individual entering the stressful situation if an adequate understanding is to be reached. The current study does not allow for pre-morbid analysis of character and little insight has been gained into the personalities of M.E. sufferers. It may be important to note, however, that a case has been made for hereditary factors increasing the individual's vulnerability to M.E. Traits like neuroticism and trait anxiety have also been argued to have an hereditary component (Eysenck, 1967; Gray, 1981) (in Fisher and Reason, 1988), and it is quite possible that personality characteristics and learned behaviours, which are 'inherited' either through the early environment or through the individual's genes, may be very important in contributing to the individual's perceptions of stress; and this may, in turn, influence the developement of disease. Eysenck (In Fisher and Reason, 1988) points out that neuroticism and trait anxiety are correlated with each other to a factor of +0,70 - a high correlation - and that both of these features are im-

portant in determining how the individual will react to stress. The Ways of Coping questionnaire used on this study does give some insight into certain personality traits. One such trait, which may be related to the development of illness when exposed to stress, is inhibition of thoughts, feelings and behaviours. Freud (1915) (in Haan, 1977) suggested that inhibition required an ongoing investment of energy and postulated that this could result in psychological problems such as neuroses. Pennebaker (1988) takes this theory further, looking at the physiological work required to suppress thoughts, feelings and behaviours. He finds that short-term effects of inhibition include physiological changes (such as increase of skin conductance, heart rate and blood pressure) while long-term inhibition is related to the onset of diseases such as infections and gastrointestinal disorders. Pennebaker's research looks specifically at the inhibition of confiding in others after a traumatic event. He suggests that confiding allows the individual to cognitively organise or integrate the event, thus reducing the physiological energy wasted. He also holds that disclosure of the event allows the event to be 'translated' into language and thus distances the event from the the individual to a certain extent. In the current study, a correlation will be sought between the subjects' inhibitory behaviour (such as coping through denial) and the general health reported. It is also expected that subjects who have experienced an embarrassing or otherwise unacceptable situation will inhibit their feelings more and be less likely to confide in a significant other, thus decreasing the ameliorative effect of social support on stress.

The Cognitive Process

If stress is a relationship between the person and her environment, cognitive appraisal is the vital link between what happens outside and the way that it is represented in the internal world of the individual. Folkman and Lazarus (1985) postulate two components within the stage of cognitive appraisal. In the first stage the individual gauges whether the situation is irrelevant, benign-positive or stressful. If the situation is irrelevant it has no significance for the individual's well-being and if it is benign-positive, only a good outcome is expected. In order for an appraisal to be stressful, there must be some degree of threat, challenge or harm-loss (which refers to situations where the loss has already been sustained - such as a friendship lost). Thus it is expected that a

harm/loss primary appraisal will be positively correlated with negative outcome. In the second stage, the individual looks at the coping resources open to her and asks "what can I do?". Folkman and Lazarus (1985) postulate that the primary and secondary appraisal stages operate interdependently and coping may intervene at any stage. For example, an appropriate coping strategy may transform an event from stressful to benign-positive in the primary appraisal stage, thereby pre-empting the whole stress response. The reverse is also true, and Folkman and Lazarus use emotions as diagnostic tools with which to measure how the individual appraises herself and her interactions with the environment. Primary and secondary appraisals should be situation specific; the subject should be able to tell the difference between situations and react appropriately

Reason (1988) postulates that severe stress can induce cognitive failure. Although not the first researcher to put this hypothesis forward, his perspective is clear and interesting. Most of the research investigating the effect of 'real life' stress (i.e. not lab. tests) on cognitive processing has been done in the military, and it has been found that as few as 15% of able-bodied soldiers actually shot at the enemy during confrontation (Marshall, 1978; in Fisher and Reason, 1988). Reason goes on to the point that cognitive failure does occur outside of high stress situations, but the incidence of failure appears to increase upon exposure to stress. Broadbent (1982; in Fisher and Reason, 1988) finds support for the hypothesised relationship between stress levels and cognitive failure, namely that increased levels of cognitive failure are related to increased vulnerability to externally imposed stress. The reciprocal of this relationship may also be true. Similar to the concentration failure reported by M.E. sufferers, Horowitz (1979) found that psychiatric illness was associated with attentional deficits - which is to be expected, considering the preoccupation of the conscious mind. It is also understandable that attention to customary actions is considerably diminished in periods of extreme life stress (Reason and Lucas, 1984, in Fisher and Reason, 1988). This may partially explain why subjects seem to have a sequence of events befalling them - after a severely stressful event, the incidence of accidents and other mishaps may increase. Lucas (1985, in Fisher and Reason, 1988) found that increased error rating was associated with neg-

ative mood states, although the causative direction of this relationship is not established in this study.

Cognitive set is also important in understanding the attributional style of the individual. This study attempts to gain some insight into the way in which the subjects explain events to themselves. It is important as a meditator both through effecting state of mind as well as concrete action taken in the world. Sense of control, competence and expected outcome will be tapped through the questionnaires.

Stresses relevant to the Selected Population

Due to the specific nature of the population, it was expected that they were more likely to have experienced certain threats, due to their age, sex and socioeconomic status. Financial and martial stresses, as well as anxiety associated with bereavement or prolonged illness were anticipated to a larger degree than stresses resulting from, for example, environmental catastrophes. Occupational stresses may have been more relevant to the subjects at the onset of M.E. than at the time of the study due to the drop in employment (see graph 4, Appendix 1); thus no review of the impact of occupational stress is included in the literature review, as this was not a primary area of focus and an attempt to summarise the plethora of research in this area was not deemed neccessary. A brief review of the relevant literature in some of the former areas has therefore been compiled. It should be noted, however, that there is a vast body of research in each of these areas and the information presented here has been specifically selected and summarised.

BEREAVEMENT

Francis Clegg (in Fisher and Reason, 1988) defines bereavement as the state which follows an actual or perceived loss. This broad conceptualisation allows us to see the plethora of situations which may evoke feelings of bereavement in the subjects of this study. Their age range puts them at risk for the loss of their own parents and at the same time allows them to have children of their own. Those in the upper quarter of the range are also at increased risk of losing siblings and friends. The onset of M.E. will induce certain losses - including the loss of employment, financial security, homes and health. In addition, it may put strain on the relationships which could otherwise serve to mitigate against the bereavement, thereby decreasing the level of support available and increasing the chance of losing this relationship as well. Once again, the subjective perception of the loss must be taken into account - the loss of a pet may be a source of feelings of bereavement (Keddie, 1977, in Fisher and Reason, 1988). The individual in context must also be considered - cultural norms, previous losses, the perceived

quality of the lost or transformed relationship, the existence of support, the circumstances of the loss and the bereaved person's personality must be considered.

Bereavement has been accepted as a source of stress by professionals and laymen for centuries. Freud (1917, 1926; in Haan, 1977) was the first to suggest a formal theoretical reason for the pain associated with loss. His explanation is anchored to the premise that all individuals have both positive and negative feelings towards the love object and when the love object is lost the mourner attempts to deny the negative feelings by identifying with the lost person. This impedes the process of detachment and may lead to pathological states or behaviours. There have been numerous modifications and critiques of this theory (e.g. Bowlby, 1969, 1980; in Appley, 1986) and many attempts to understand the process have been made. A review of these theoretical viewpoints is beyond the scope of this thesis, but it should be noted that Bowlby postulated that the threat of loss results in the activation of 'attachment behaviours' which include anxiety, depression, anger and a state of physiological arousal. Bowlby does not specify the exact nature of this arousal, but the physiological effects of the stress arousal response and the associated increase in risk of disease may shed some light on the increased levels of morbidity and mortality found amongst the bereaved. In 1972 Parkes assessed the mortality rates of 1967 and noted that a small number of people were reported to have died of grief. There have been a number of studies investigating the reason for the increased incidence of death amongst mourners and Stroebe and Stroebe (1983; in Fisher and Reason, 1988) provide a thorough review of the work in this field. Although they critique some of the methodologies employed, they conclude that there is a consistently reported increase in mortality following loss, particularly amongst men. More support has been found for increased illness rates amongst the bereaved, with Parkes and Brown (1972, in Parks, 1984) reporting a hospitalisation rate three times higher amongst bereaved people than amongst the control group. The reasons for this increase are varied; the bereaved person may misinterpret the physiological response to loss as illness, or they may alter their lifestyles to include more tobacco or substance abuse and poorer nutrition.

The effect of bereavement on the physiological functioning of the individual has been studied by Bartrop et al (1977, cited in Fisher and Reason, 1988), who finds changes in immune response and altered patterns of corticosteroid production. McDermott and Cobb (1939, in Fisher and Reason, 1988) suggest a link between bronchial asthma and stress and Stein and Charles (1971, in Fisher and Reason, 1988) propose a connection between loss and diabetes mellitus. Listing physiological responses to acute grief, Worden (1982, in Fisher and Reason, 1988) includes muscle weakness, lack of energy, dryness of mouth, increased sensitivity to noise, breathlessness, unpleasant hollowness of stomach and tightness of chest. Parkes (1970, in Parkes, 1984) adds panic attacks, increased muscle tension and restlessness and Maddison and Viola (1968, in Fisher and Reason, 1988) list a number of symptoms including headaches, dizziness, fainting, appetite and digestive disturbances, menstrual disturbances and general aching which are commonly seen in bereaved persons. These lists cover many of the cardinal features of M.E., but this does not imply a relationship as the symptoms listed here are very general and may be reported at the onset of many other diseases. It is interesting, however, that most other diseases go on to produce cardinal features while M.E. remains a frustratingly vague syndrome. The similarity between the reported symptoms of M.E. and those associated with bereavement would, however, become important if a significant number of subjects on the study report a bereavement in the premorbid period.

A problem with the postulation that major stresses such as bereavement, combined with the existence of a certain virus, can lead to a post-viral fatigue is that there are many individuals who are exposed to losses and viruses who do not contract M.E. In the same way, the D.S.M. 111 distinguishes between 'normal' grief, which may include feelings of guilt or depression, and complicated bereavement which leads to a separately identifiable mental disorder. In a study such as the present one, the nature of the bereavement cannot be retrospectively determined; the distinction between normal and complicated depression is difficult enough to draw in the present and almost impossible after the intervention of a debilitating illness.

The diathesis-stress model provides an interesting model for considering inter-individual differences in psychological and physiological responses to stress. Rosenhan and Seligman (1984; in Fisher and Reason, 1988) suggest that there is a constitutional tendency towards certain pathologies and the exposure to stress triggers initial or subsequent episodes. This model would explain why only some individuals who are exposed to life stresses such as bereavement will respond in a manner which puts them at risk for post viral fatigue.

In critiquing the Life Events Scale developed by Holmes and Rahe (1967), Dohrenwend and Martin (1978) suggest that events which are the result of deliberate decision making may be less stressful than those, such as bereavement, over which the individual has no control. The onset of a viral illness, followed by a post- [illegible]y also be an event over which the sufferer feels that she has no contr[illegible]aret[illegible]nd Martin are correct in their assumption, and if the postulated relationship between increased perception of stress and relapse of M.E. is supported, we can expect to find a relation between increased relapse and the reporting of stressful, uncontrollable events.

MARRIAGE AND DIVORCE

It cannot be denied that marital status effects the individual, but the exact nature of the effect is not clear. The mortality rates for deaths from all causes is currently greater for single people (including those who are widowed and divorced) than they are for married people (Fisher and Reason, 1988). One of the highest correlations in this area is that between marital status and vulnerability to mental illness (Cochrane, 1983; Segraves, 1980; both in Fisher and Reason, 1988). Numerous theories may be put forward to understand the relationship between marital status and decreased good health. Unmarried individuals may be more exposed to stress and have a less effective social support system. They may have lower self-esteem and socio-economic factors may come into play. An alternative hypothesis is that these individuals are not married for reasons which may, in themselves, increase vulnerability to stress. Inability to communicate and maladaptive attempts to deal with the environment may have lead them to be overlooked in the selection of a partner and thus marital status may not be causally related

to poorer health. On the other hand, it has been suggested (Cohen et al, 1984; Lazarus, Kanner and Folkman, 1980; all in Fisher and Reason, 1988) that a better subjective quality of life, which is found more amongst married than unmarried individuals, should lead to fewer psychological problems. In addition to this, Brown and Harris (1978; in Fisher and Reason, 1988) found that one of the strongest indicators as to whether women would become depressed in the face of stressors was the absence of an intimate relationship. It should be noted that the nature of the marital relationship is very important here and marital stresses reported by the subjects should be taken into account, indicating that the individual may not have an intimate relationship even though they fall into the married category. Also, married individuals have more access to support networks in the form of relations and extended family and couples may be more acceptable within a society where marriage is the norm.

Although marriage can be seen as a source of increased social support, it may also be a source of stress in itself, thereby contributing to poor health. Martial difficulties have been associated with hypochondriasis (Krietman, 1965; in Appley, 1986) and psychosomatic disorders (Waring, 1977, in Fisher and Reason, 1988). Also, stresses experienced by one member may effect the family as a whole - for this reason Mitchell et al (1983 in Fisher and Reason, 1988) suggest that the stress levels within the family may be more important than individual levels. Although this study does not intend to look at the family unit, it may be an area for future M.E. research.

Children may bring illnesses, financial strain, schooling and disciplinary problems. Also, in the transition to parenthood, Miller and Sollie (1980; in Fisher and Reason, 1988) report increased levels of personal and marital stress after the birth of the first child. Another area of stress affecting women, and particularly mothers, is the role conflict associated with working and having a family concurrently. Given the current economic climate in South Africa, many of the women on the study may be under pressure to find employment, and through their illness they may be getting the worst of both worlds. Having M.E. makes them inaccessible to their families, but they do not have the psychological or financial benefits of having a job. It has been suggested that these benefits

are as important for women as they are for men (Tennant et al, 1982; Cochrane and Stopes-Roe, 1981; all in Fisher and Reason, 1988). M.E. will also prevent the subjects from taking on a multiplicity of roles and it has been found that many, varied roles are conducive to good health (Barnett and Baruch, 1985; Thoits, 1983; both cited in Fisher and Reason, 1988).

As some of the subjects on the study are divorced, it is useful to note that there are two factors at work here. The trauma of ending a relationship and the fact that the individual finds herself single again, and may experience the associated lack of support. The stresses effecting divorced women were found to be economic in origin, as well as linked to lack of support with child care (Gersel et al, 1985; cited in Fisher and Reason, 1988), while men report lack of emotional support and social integration. If this hypothesis holds, divorced M.E. sufferers on this study would be expected to report economic and child rearing stresses, as these stresses can only be exacerbated by the illness.

Of course, the division of subjects into two categories - married and unmarried - is simplistic as, in reality, many people are in transition phases, and the significance of these stages or transitions will vary with the individual and the social context. It is therefore better to divide the subjects into those who have a significant other in their lives - a person on whom they can rely for support and intimacy. Although this division is much broader than a married/ not married division, it is believed that it serves to qualify the level of social support more clearly. In either case, there is a difficulty in proving the nature of the causal relationship between relationships and better health. The data generated by research in this area could equally well support the hypothesis that good health is causally related to being in a relationship. An unwell person may not be motivated towards establishing an intimate relationship and may also appear less attractive to a prospective partner. This is exacerbated in the case of M.E. because of the poor prognosis and the lingering suspicion that it is a psychosomatic illness and therefore may be indicative of some underlying psychological pathology. If this is the case, women in some societies may be effected to a lesser degree because they may play

a less active role in the courtship process and ill health of a spouse may pose less of a financial stress on a husband than on a wife.

STRESS AND DISEASE

Introduction

"There is little disagreement with the notion that stress arousal plays a major role in the ultimate determination of human health" (Everly, 1989, p 4). Tower (1984) reviewed 523 reports on the relation ship between psychosocial factors and illness; in summary she states that over 28 000 fugitive studies would be necessary in order to reject the claim that psychosocial factors are related to disease. It is widely accepted amongst theorists working in this field that severe stress can contribute to the onset and perpetuation of disease. The individual's reaction to the stressor itself can become a major source of stress, and a negative spiral may be set up whereby the debilitated individual is made more vulnerable to other stresses. The relationship between ill health and stress can thus be seen, but the exact causal relationship between the factors has yet to be determined.

In 1980 the U.S. Centre for Disease Control published estimates of the contribution of 4 factors to the 10 leading causes of premature death. 'Lifestyle' ranked as a top cause of death, this being an umbrella term covering a multitude of factors such as diet, exercise, hobbies, levels of pessimism and security and, of course, levels of stress. Personality type, defined in terms of different ways of dealing with stress, have been found to be much more predictive of death from cancer and cardiovascular disease than smoking, drinking and medical diseases (Eysenck, 1988). Any negative experience, including stress, can be said to decrease the individual's perceived quality of life. So a stressful event which is perceived to have negative consequences for the individual will lessen the individual's sense of well-being, but it may not lead directly into physiological or psychological disease. There are numerous other factors at work here, some of which will be outlined in the following chapters.

The Physiology of Stress

At the outset of this section, it should be noted that the hypothesis that 'stress causes illness' is just as unidimensional as the hypothesis that 'microbes cause illness". Instead, we should look at stress as an agent in the organism-host interaction; as one factor amongst many which may contribute to the onset and progression of disease. There are at least three ways that stress can contribute to poor health.

1. In an attempt to cope, the individual may develop behaviours which are be detrimental to her health - for example substance abuse, poor diet and lack of rest. Stresses may also decrease the incidence of behaviours which promote or maintain good health. Cognitive and behavioural patterns may be set up at this time which alienate the individual from potential support and disrupt normal lifestyle patterns and these factors can, in turn, have a negative effect on the individual's physiological functioning.

2. Physiological functions may be directly disrupted through the occurrence of a stress - for example, the increased plasma noradrenalin levels following exposure to stress may disrupt intermediary fat metabolism and result in the deposit of fat in the arteries.

3. Stress has been found to lower the body's humoral and cell-mediated immune response - this increases the likelihood of contracting viral or infectious illnesses and decreases chances of containing or overcoming disease.

Although listed and discussed separately, it is important to realise that these pathways do not operate independently; they interact in a complicated fashion which physiologists are still trying to understand. They have concluded, though, that the physiological state of the individual varies with the exposure to stress (Mason, 1972, in Appley, 1986). Blood pressure and cardiac output rise and the retention of salt and water increases. Blood is redirected to the musculature and the circulation and production of red blood cells increases. Metabolic changes include an increase in amino acids, glucose and fatty acids being released from macro-molecular storage forms and pumped into the blood,

along with a decrease in the blood supply to the kidney, skin and gut. The repair and growth of b[illegible] is also inhibited, as is the production of cells used by the immune system (the production of lymph and white blood cells decreases and the thymus shrinks). Also, the cellular, endocrine, psychological and behavioural activities which encourage sexual response show a drop. Catabolic hormone levels increase (cortisol, epinephrine, norepinephrine, growth hormone and vasopressin) while the levels of anabolic hormones such as insulin, testosterone, oestrogen and prolactin decrease.

Engel (1968) put forward the hypothesis that most disease (70 - 80 % in his study) occurs within the contexts of primary feelings of hopelessness and helplessness. This hypothesis puts the emphasis on the individual reaction to stress, rather than the stressful occurrence itself. The feelings of hopelessness and helplessness are accompanied, and exacerbated, by low self-esteem, inability to enjoy activities which were enjoyed previously, disruption in the continuity of past, present and future and a reactivation of previous memories of giving up. High levels of stress associated with feelings of helplessness and hopelessness were also correlated with increased spread of cervical cancer (Goodkin, Antoni and Blaney, 1986) and breast cancer (Jensen, 1987). Support for the relationship between feelings of hopelessness and helplessness and increased physical illness will be sought in this study.

STRESS AND THE SYSTEMS EFFECTED BY M.E.

Given the vague nature of the illness, the exact systems effected by M.E. are difficult to pinpoint, but certain systems have been isolated as commonly effected by M.E. This chapter looks at these systems and their usual responses to stressful stimuli.

The Immune System

The immune system is responsible for maintaining the integrity of an organism by dealing with foreign substances which impinge on the organism from the environment. The immune system comprises two components - cell-mediated immunity and humoral immunity. The basic cellular unit of both components is the lymphocyte. It must be noted that the action of these systems may have both protective and pathological effects

on the organism. A substance which is recognised as foreign is called an antigen - these antigens become bonded to the surface of a lymphocyte and this stimulates the lymphocyte to multiply and deal with the foreign body by engulfing or destroying it. The lymphocytes have a memory and so, upon second exposure to the same antigen, their response will be quicker and more effective. The humoral immunity system deals with antigens by "bombarding" them with antibodies and a variety of studies on animals have shown that stressors alter humoral immune responses (Petrovskii, 1961; Solomon, 1969, in Appley, 1986). More recent studies have found that acute exposure to a stressor can inhibit humoral immunity response but repeated exposure may cause an enhanced response. (Gisler, 1974). The relationship becomes further complicated if the biological and social characteristics of the organism are considered in conjunction with the nature and intensity of the stress response (Joasoo & McKenzie (1976). Animal studies have reported similar findings when investigating the relationship between stress and cell mediated immunity. The relationship between humoral stress response and psychological state in man has not been as well supported but there are reports that some correlation exists (Fessel, 1972). Thus the functioning of the immune system can be seen as a somatic response in which the brain can intervene. If levels of arousal are very high, the brain stimulates the release of ACTH, cortisol and other catabolic hormones which will suppress the immunity and inflammatory systems until the level of arousal drops (Keller et al, 1983; Schleifer et al, 1985; both in Appley, 1986). This may help to explain why individuals fall ill after periods of intense arousal, and may be important in understanding the development or relapse of M.E. after severe stresses.

A summary of the research done by Borysenko (1984), Cale[illegible] Kling, and Gold (1987) and Jemmott and Locke (1984) (all cited in Appley, 19[illegible] vals that stress, bereavement and depression are significant immunosupressors with the amount of suppression increasing with the intensity of the stressor. Bartrop et al (1977; in Appley, 1986) reported a drop in lymphocyte responses in widows and widowers, but a long-term follow-up of this study has not appeared as yet, so no conclusions on the effect of immune system involvement on infections or malignant diseases may be drawn. Schmale (1958) found that pathological mourning antecedded autoimmune diseases like

rheumatoid arthritis, giant cell arteritis, systematic lupus erythematosis, polymyalgia, Sjogren's syndrome and autoimmune thyroid disease. Prolonged stress may be more effective as an immunosupressor than acute, intense stress and the effect of the immunosupressor will be decreased if the individual has a sense of control over the stressor.

Psychoneuroimmunology

Until recently, attempts to understand the stress process have been pitched either in the psychological arena - looking at perceptions, cognitions and affective responses - or in the physiological arena. As neither of these areas have provided adequate answers, attempts are now being made to bring the fields together. Attempts to find a 'psychobiology' to explain the relationship between the physiological state and various states of mind date back to Hippocrates. Freud's 'Project for scientific psychology' was an attempt to develop a psychology based on physiological and evolutionary theory. More recently, there has been an explosion of research into the connection between psychological state and neuroendocrine processes. A primary area for research in this area is that of depression, but the field of stress research also provides great potential. Research in psychoneuroimmunology has grown rapidly following the work done by Amkraut and Solomin (1974). In December 1982 the first conference, organised by the EEC, was held in Utrecht. The delegates were from vastly different fields, including psychologists, neurologists and immunologists. Reports concerning inter-disciplinary tolerance were not optimistic (Totman, 1988), but the field of psychoneuroimmunology has subsequently emerged and has made some interesting findings as regards the relationships between emotional well-being, neuroendocrine activity and immune system function. Unfortunately, growth has been inhibited by inter-professional disputes between organic and psychological schools of thought.

The Endocrine System

In 1956 Selye suggested that a relationship between the stress response and the endocrine system existed. He defined hormones as "specific chemical messenger-

substances, made by an endocrine gland and secreted into the blood, to regulate and coordinate the functions of distant organs." (pp. 21, Monat and Lazarus, 1977). Whilst working in an endocrinology laboratory in 1936, Selye realised that the hormonal and gland change which he had solicited by injecting sex hormones were not the result of the injected hormones themselves, but rather the result of injecting any foreign toxin into the body. He defined this as a nonspecific response and did numerous experiments showing that a seemingly endless variety of stimuli could elicit the same physiological changes. Enlargement of the adrenal cortex, shrinking of the thymus, spleen and lymph nodes and duodenal ulcers appeared after the injection of a wide variety of pure and impure substances, and with physical agents such as cold, heat, x-ray, mechanical trauma, pain and forced muscular exercise. These changes only happened initially, however, and Selye named this initial stage the 'alarm stage'; it was followed by a resistance stage in which the organism appeared to have adapted to the stimulus. Eventually, exhaustion set in, with physiological symptoms similar to the alarm stage. Selye called the entire process the general adaptation syndrome (GAS).

More recently, much work has been done linking the immune and endocrine systems in terms of their response to stress; a particularly well-researched neuroendocrine system is the hypothalamic - pituitary - adreno - cortical axis (HPAC). Corticosteroids, which are associated with this axis, are stimulated by a variety of stressful experiences and they, in turn, have extensive and complex effects on the immunity system. Situations involving loss of status or power or feelings of helplessness have been shown to be linked to increased levels of corticosteroids (eg. Henry, 1982; Mason, 1968; Weinberg and Levine, 1980; all in Fisher and Reason, 1988). The HPAC axis is of particular interest to behavioural scientists as depressed individuals have been found to have significant levels of cortisol. (Gilbert, in Fisher and Reason, 1988). Gilbert highlights the controversy which has existed around this finding, suggesting that increased release of cortisol may be the result of non-specific stress response rather than the cause of depression. Christie (1986, in Fisher and Reason, 1988) suggests that increased cortisol levels may indicate severe psychiatric disturbance rather than depression. Fisher (1988) writes that the release of catecholamines is associated with effort and challenge, while both

catecholamines and cortisol are released when the individual undergoes effort and distress. Further, only cortisol is released when the individual is helpless and distressed.

The group of catecholamines is an important group for stress research as it includes hormones which effect the circulatory and metabolic systems through the action of adrenalin. The major purpose of adrenalin is to mobilise glucose as a source of energy in times of crisis. It also increases cardiac and pulmonary functioning. The body's ability to secrete these hormones in response to psychological factors was first noticed by Cannon in 1929 when he put forward his 'fight or flight' theory. Recent work in this area has indicated that these hormones may be highly situation-specific and sensitive to perceived frustration and feelings of emotional effort or stress (Frankenhaeuser, 1976; Cox, 1982).

Growth hormone (GH) has also been found to be responsive to stressful experiences in humans (Cox, 1984), this relationship is complicated, however, by the relationship between GH and certain personality factors such as social engagement (Greene, 1970), levels of neuroticism (Miyabo, 1976; cited in Fisher and Reason, 1988) and type-A behaviour (Friedman and Rosenman, 1971, in Fisher and Reason, 1988). Increased levels of GH have also been linked to enhanced immunity system function. Following exposure to stress, Elliott and Eisdorfer (1982, in Fisher and Reason, 1988) recorded elevations in free fatty acids, epinephrine and norepinephrine in the blood. Catecholamine and adrenocorticosteroid levels in the urine are also increased. Stein and Schleifer (1985, in Fisher and Reason, 1988) point out that changes in thyroid hormones, growth hormones and sex steroids have been associated with stress and they are all reported to effect immunity system function. The pituitary-adreno-cortical system appears to partially under the control of the hippocampus and thus it may be linked to those cognitive functions which arise in the hippocampus. Among these are general and social learning, as well as memory. Cox (1988) suggests that this link may partially explain why experiences of learning and mastery may be associated with lower levels of physiological response to stressful situations

The cyclical nature of some disorders (e.g. manic depression) is thought to be related to the cyclical activity patterns governing endocrine activity in the body (Rosenthal, 1984). Hormonal changes have profound effects on mood and other psychological variables. This may be relevant in trying to understand the relapses reported by M.E. patients; cyclical relapses following seasonal changes can be explained through endocrine cycles, as can physiological cycles such as the menstrual cycle. Many M.E. sufferers report relapses at certain times of the year and at the onset of their menstrual cycle.

Cox and Mackay (1982) provide convincing evidence supporting the role of sex, growth and stress hormones in the development of malignancy. This area is complicated by the various theoretical standpoints regarding the onset of cancer, as well as the fact that there may be a delay of up to twenty years between the appearance of the first carcinogenic neoplasm and the development of a detectable tumour. This delay provides ample time for psychological and social variables to influence the progression of the disease through altering the hormonal and neurological climate in which the cancer cells are growing. Psychological state may also influence the development of cancer through its link to carcinogenic behaviours such as smoking and alcohol abuse, as well as through its influence on metabolic rate. All of these factors may increase the probability of an oncogene occurring as well as directly influencing the tumorigenic process. An important area of research here is how stress directly effects natural killer (NK) cells; these cells destroy other cells which are malfunctioning, and any inhibition of these cells in the early stages of cancer may be important in the continuance of the disease. Perceptions of control and repressed personalities have been two areas where cancer research has focused.

Arnetz et al (1983, in Appley, 1986) reported a relationship between social isolation and hormone level in elderly people, finding that individuals who were not isolated showed increase in testosterone, estradiol and plasma growth hormone. Also, Thomas (1979, in Appley, 1986) has linked the occurrence of malignancy with a lack of closeness with parents. Although the current research looks neither at malignancy nor parental re-

lationships, it is important to be aware of research linking state of mind and personal relationships to the occurrence of disease.

Another important relationship is that between the endocrine system and the action of neurotransmitters. Leshner (1979, in Appley, 1986) puts forward two ways in which the endocrine system influences neurotransmitters. In the resting state, it is thought that each individual has a baseline hormonal state and this state will play a part in determining the individual's response should a stressful situation arise. Then there are ways in which the endocrine system feeds back into the neurotransmitter system in order to control behaviour during the phase of arousal following exposure to a stimulus. Thus, if individuals differ in their baseline state, as indeed they do, their responses to stressful situations will also differ. To tie this to other research in this area, it is possible that variables such as social interactions may alter the baseline state of the individual. Also, after the stressful encounter has been made, the stable state to which the individual returns may be different to the initial state - this hypothesis could be useful in explaining the apparently cumulative effects of stress. Whybrow (1984) goes further to suggest that the stress process initiates a positive feedback cycle in the individual where a hypersensitivity to the individual's own stress hormones exists and so a spiral of dysfunction is set in motion. Although an interesting hypothesis, this idea awaits trail through further research.

Perceptions of control are important determinants of an organism's physiological response to a traumatic event (Gilbert, 1988). An examination of neurotransmitters shows that no change in levels of NA and 5-HT are found when some control over a moderately stressful situation is offered. However, if no possibility of control exists, levels of NA drop. This is accompanied by, and may be related to, increase in levels of cortisol, monoamine oxidase activity and acetylcholine activity. This combination of hormones and neurotransmitters will initially propel the individual into an alert state, where solutions and/or escape plans are considered. But if the search proves fruitless and the stressor remains constant, the individual enters a retarded or inhibited state. Gilbert (1988) associates this change with a cognitive move towards inaction and focus

on 'what not to do' rather than action- focused cognitions. He draws a parallel between this state and that of depression associated with learned helplessness. However, he concedes that the physiological and psychological changes that an individual will experience when faced with an uncontrollable and traumatic event will be greatly effected by the individual's personality and the incentives inherent in the specific situation. The relationship between perceptions of control and levels of reported illness in the current study will be noted.

Riley (1979, 1981) has reported interesting results regarding the response of the immunity systems of mice to stressful events. He reports that mildly stressful handling led to significant increases in corticosterone levels and to rapid increase in the size of non-histocompatible tumours in the mice. Riley attributes his findings to corticosterone-induced immunosupression, although there may be other factors in the endocrine and immunity systems at work.

The Gastrointestinal System

Many M.E. sufferers complain of gastrointestinal (GIT) problems, but the relationship between stress and gastric disease is not a linear one. Eisdorfer (in Zale, 1985) reviews the literature in this area and concludes that more than 20 individual factors may be involved in altering the risk for peptic ulcers, ranging from genetic to behavioural to unresolved conflicts over dependency. Emotional state is clearly linked to the occurrence of peptic ulcers (Mahl and Brody, 1954, Wolf and Glass, 1950). Weiner, Thaler, Reiser and Mirsky (1957) have linked emotional and genetic factors to the development of gastric ulcers, with a more specific study by Backus and Dudley (1977) suggesting that a feeling of deprivation may contribute to the development of duodenal ulcers. Grace, Wolf and Wolff (1950) studied the development of ulcerative colitis, linking it with stress and feelings of anger and resentment while both ulcerative colitis and irritable bowel syndrome are commonly seen in patients who exhibit compulsiveness and interpersonal sensitivity (Latimer 1985). Young et al (1987) have asserted that oesophageal reflux (heartburn) is a common stress-related disorder; their findings are supported by Dotevall (1985).

The Cardiovascular system

The current literature on biochemical processes which may lead to cardiovascular disease is not entirely convincing - largely because the exact nature and aetiology of atherosclerosis is not fully understood. The cardiovascular system is considered by many researchers to be the prime target for the stress response and studies have linked stress to essential hypertension (Eliot, 1979; Henry and Stephens, 1977 and Weiner, 1977) as well as to migraine headaches (Guyton, 1982) and Raynaud's disease (Taub and Stroebel, 1978). A central problem resulting from a chronic state of arousal is the resultant hypertension which effects every vessel and organ in the body (Sterling and Eyer, 1988). In addition, elevated cholesterol and other lipids cause atherosclerosis.

Early work in this area included the division of personality types into 'type A' and 'type B' by Friedman and Rosenman (1959) - although this division has been critiqued, there is evidence that the aggressive, work-oriented 'type A' is at a greater risk for coronary heart disease (CHD). Rahe (1988) studied the effects of recent stressful life change on the development of CHD and found that certain emotions (such as hostility, home problems and life dissatisfaction) and certain behaviours (overwork and time urgency) were found to be related to the occurrence of CHD. He points out, however, that disease in general may be predicted by recent life change and that CHD patients reported a relatively low recent life changes baseline. Rahe suggests that the sympathetic nervous system will be important in future research attempting to understand how perceived stress can effect the cardiovascular system. Boman (1988) emphasises that certain psychosocial variables may predict coronary heart disease, and links CHD to the type A behavioural pattern. These individuals manifest high levels of neuroticism and hostility and often attempt to be upwardly mobile in society - this contributes to their high level of arousal and increases their vulnerability to loss and failure. He points out that this increase can be linked to physiological changes which increase the individual's risk for CHD. These physiological changes are noted by other researchers as well. Friedman and Rosenman (1974) found that cholesterol level fluctuated with stress levels and that increased plasma lipids, intimal damage, altered haemodynamics and accelerated blood clotting are all associated with increased stress levels and are factors in the

development of CHD. These changes may result from the direct effect of stress on the body or from maladaptive behaviours resulting from the exposure to stress - such as lack of exercise, increased consumption of fatty foods and increased alcohol and cigarette consumption.

The Brain

Psychiatry is one field that is accustomed to the connection between stress and illness; both endocrine and psychiatric illnesses have been linked to psychosocial events, particularly to events such as losses and cumulative disruptive occurrences in the individual's development. Depression, alcohol and substance abuse, sleep disorders and some forms of psychosis are often seen to have a psychosocial component in their aetiology. Once again, the relationships are not simple. A study of bereaved people showed that 45 became severely depressed within 1 year after their loss. (Bornstein et al, 1973). This increase in the incidence of depression led to an increase in the suicide rate - but this alone cannot account for the increase in mortality rate amongst bereaved people (Rees et al, 1967; Parks et al, 1969). Rather than simply assuming that bereaved people were more susceptible to illness and death, a study of their change in habits after the loss shows that they smoke more cigarettes, drink more alcohol and use more narcotic substances - all of which contribute to chronic disease (Parkes and Brown, 1972). Variables such as these confound the relationship between stress and illness if they are not controlled.

Stress can become dangerous for the individual if attempts to deal with the stressor result in behaviour which is self-destructive on a conscious or unconscious level (Kessler et al, 1985). An overt expression of this self-destructive tendency may by a suicide attempt, while a covert example would be the inhibition of the immune system. In terms of Darwinian theory, the organism must attempt to adapt to the changing environment, and individuals who adapt within a society have a far greater chance of survival. This links up with the role theory of the individual in relation to others - individuals who do not have a role within the societal net have less survival value to the species and are potentially a drain on the society's resources. In this light, it could be postulated that

there is a genetic code which ensures the survival of the society through 'programming' for self-destruction once psychological stress has become so great that the individual has lost her role within the society. This may seem like a wild theoretical leap, but similar behaviour is seen in the animal kingdom, where ill or aged animals, which can no longer contribute to the society, will move away from the group. In the human body, too, a sort of altruistic suicide is seen in cells which are partially maimed (for example by sunburn) - they are programmed to kill themselves off in order to allow the new, healthy cells full access to the body's resources.

Musculoskeletal, Dermatological and Respiratory Systems

M.E. sufferers report a variety of skin problems, including thrush, candida and various rashes and allergies. Holmes, Trenting and Wolff (1951) have shown a connection between stressful situations and the development of allergies and it is widely accepted that bronchial asthma can be caused, or at least exacerbated, by psychosocial factors such as stress (Lachman, 1972; Knapp, 1982). Skin diseases like eczema and psoriasis are a common reaction to stress (Lachman,1972; Engels, 1985) and Medansky (1972) claims that 80% of dermatological patients have a psychological overlay. The musculoskeletal system also responds to stress - the musculature in the body reacts to the stressful stimulus by contracting in preparation for the 'fight or flight' response but if there is no physical action forthcoming the blood flow to the muscles decreases and the level of metabolites increases; pain is thus experienced (Dorpat and Holmes, 1955; Holmes and Wolff, 1952) and there may be a link between this phenomenon and the pain experienced by M.E. sufferers.

Appley and Trumbull (in Monat and Lazarus, 1977) write about the overt emotional response to stress and include observations of tremors, increased reaction time, erratic performance rates, malcoordination, error increase and fatigue. Headaches, gastrointestinal disorders and metabolic change can be added to this list and these observations, while rather vague, cover many of the symptoms commonly reported by M.E. sufferers. However, it would be erroneous to simply explain M.E. as a physical

manifestation of stress; rather there appears to be an interaction between a number of factors and vulnerabilities.

Genetic Predisposition

Kety (in Zales, 1985) comments on the research linking psychological process to somatic change, paying particular attention to genetic factors. He holds that, within the context of stress and disease, genetic factors play a part in the development of peptic ulcers and certain types of cancer. Certain stressors may also react with genetic predispositions in the development of mental disorders. The effect of the gene itself in this process is very difficult to pinpoint - it is almost impossible to separate the physiologically inherited characteristics from the characteristics which have developed as a result of the family environment in which the child finds herself. In other words, there may appear to be a genetic factor in the development of peptic ulcers but it is difficult to exclude the possibility that the ulcers develop because the child has not learned effective coping techniques or has otherwise been effected by the environment in which she finds herself -the same environment which may have influenced the development of her parents' peptic ulcers. Riley's work (1975) has correlated with that done by Schleiffer (1985) and Harrs and Sinkovics (1970; cited in Fisher and Reason, 1988), finding that rats and mice show a higher development of malignancy when exposed to stressful stimuli. The recent discovery of oncogenes - the presence of which appear to predispose the individual to cancer - was thought to undermine this theory, but Sterling and Eyer (1988) point out that the proteins coded for by at least two of the oncogenes are exactly the same as the proteins which make up the receptor molecules for the thyroid and cortisol molecules, which are important for the stress response. This may be coincidental, but the possibility of a relationship cannot be ignored.

In spite of all the literature which links stress to disease, there are theorists in many different fields who feel that the importance of stress is overestimated or that it has any validity as a concept at all. Arnott (1954), referring to the aetiological connection between stress and disease, claimed that the hypothesis had 'no scientifically credible basis whatsoever - in fact most of the evidence adduced in its support is dubious and much

of it absurd." (cited in Kasl and Cooper, 1987, pg 28). Engel (1985) concludes that "...stress is neither a noun, nor a verb, nor an adjective. It is an escape from reality" (Engel, 1985, pg 10). In my opinion, an overall analysis of the literature on stress does not support these views, but it does allow one to understand how theorists can become frustrated with the multifaceted and sometimes vaguely defined concept of stress. The fact that stress has been researched on three rather isolated levels in the past does not facilitate clarity. It is only recently that cross-level associations between social, psychological and physiological research and theory have been made (eg Ekman, Levenson and Friesen, 1983; Depue and Monroe, 1986).

Summary

From the above, it can be seen that there is an undeniable link between psychosocial and environmental factors and the development and exacerbation of disease. In particular, all of the systems effected by M.E. are also responsive to the levels of stress which the individual is experiencing. This is not to say that M.E., or any other disease, is 'all in the mind', but rather that the mind and the body form a cybernetic system and they effect each other to a large extent. The relationship is not a simple one, however, and an important factor in the perception of stress and the physiological response to the stressor is the individual's ability to ameliorate the effect through the use of effective coping mechanisms (Lazarus, 1980, Everly, 1989). The search for a virus as a possible aetiology of M.E. continues but it is possible that the physical cause interacts with a latent psychological vulnerability. An investigation of the 'psychological immune system', the individual's ways of coping, is thus in order. Very broadly, coping may be viewed as "any attempt to reduce or mitigate against the aversive effects of stress" (Everly, 1989; pg 95).

COPING

Definitions of Coping

Coping refers to an effort to reduce the negative impact of demands made on the individual either from within or from the external environment. This can be done by direct actions (such as fight or flight) or by palliative modes of coping, which would attempt to lessen the emotional impact of the stress through certain thoughts or actions. In the latter, no attempt is made to change the environment, but rather to alter its impact through defences (e.g. denial), deployment (e.g. diverting the attention) or somatic methods (e.g. drug use or relaxation techniques). Analyses of coping as a mediator in the stress response have become more popular over the past decade (Folkman and Lazarus, 1980; Cohen, 1987; Folkman, 1984), strongly supporting the idea that coping mechanisms - be they behavioural, emotional or cognitive - are a very important predictor of how the individual will perceive and respond to the stressor.

It seems that the efficacy of any coping method would depend to some extent on the nature of the stressor. If nothing can be done to change the stressing stimulus, it would be more adaptive to focus on the internal reaction to the stimulus rather than continue in a frustrating struggle with the environment. This point is of particular relevance to M.E. sufferers as there is no concrete plan of action which can be undertaken to change the nature of the illness, which is a major stress in itself. Direct action coping may thus be maladaptive, particularly if sufferers persist in an action-oriented plan to conquer the illness. It has been widely reported by M.E. researchers (Macintyre, 1988; Shepherd, 1988) that an ongoing struggle with the disease will simply exacerbate fatigue and deprive the sufferer of the rest which is vital for recovery.

The literature on coping draws an important distinction between two schools of thought. Some researchers investigate dispositional styles of coping - assuming that certain individuals have a fixed repertoire of coping responses; this approach places much emphasis on the pre-morbid personality. In this study I have adopted the second approach - that which views coping as situational phenomenon and looks at the meas-

ures taken by the individual in each different situation. Thus, when asked to complete the Ways of Coping questionnaire, the subjects were asked to select one stressful event and indicate which coping methods they used in that particular situation. In order for their coping to be effective, they should match the type of coping to the situation in which they find themselves. However, a strict division between schools of thought does not allow the researcher to view the process as a whole and ignores the interaction between the individual and the situation and between the different stages of the stress response. This must be remembered when reading authors (e.g. Menaghan, in Kaplan, 1983) who draw a distinction between coping resources, coping styles and coping efforts. Coping resources are generalised attitudes and skills and they are the things which the individual brings into the stressful situation. Examples include attitudes about the self (esteem, ego strength), attitudes about the world (sense of coherence, belief in mastery), intellectual skills (cognitive flexibility, analytic abilities and knowledge) and interpersonal skills (communication skills and ease in personal interaction). Coping styles are also generalised but they are typical, habitual preferences for ways of approaching problems. Coping efforts are the specific actions - either overt or covert - which are undertaken in any given situation to overcome the identified problem. The subjects on the study will be expected to adapt their coping efforts and styles to the specific situation, while coping resources should remain more constant.

Fisher (1988) identifies complex moderating variables affecting the individual's reactions to specific life stresses. She includes perceived control or helplessness, level of self-esteem, attributional style and tendency to accept or reject blame for negative outcomes, learned resourcefulness and hardiness. In a well-rounded summary, Appley (1987) writes that the efficacy of the coping technique will depend on the interaction between situational characteristics, predispositional variables and the content of the coping strategy.

Lazarus and Folkman (1984) emphasise that coping should be seen as a process incorporating cognitive and behavioural acts rather than a goal. These acts are not simply responses; they are the result of complex intrapsychic operations and they focus on both

internal and external demands wl. are perceived as being beyond the individual's capacity (Krohne, 1989, in Appley, 208). Thus the aim of the coping act is to reduce the imbalance between demands and capacities and also to reduce the anxiety state which accompanies the imbalance. For this reason, reducing the imbalance to an exact match will not reduce anxiety (Schulz and Schonpflug) and different individuals will have different levels at which they will feel comfortable. Some people will experience no obvious negative effects when their capacity only just exceeds the demand while others need a larger margin.

The theory that stress results from a disparity between capacity and perceived demand is a popular one, but it holds some unanswered questions. Within this framework, the validity of the definition of coping is dependent on the clarity of the definitions of demand and capacity. Unfortunately, there are no universally accepted definitions of capacity and demand. There are also no values available to measure different demands and capacities and no scale upon which to measure them. Although scales have been devised, they cannot be used across different time periods and different situations. Further, the assumption that the individual either manages her emotions or resolves the problem in successful coping must be avoided. In actual fact, most coping mechanisms leave the individual somewhere along the path between chaos and resolution; reduction of presenting problems, avoidance of distress and maintenance of some level of self-esteem are achieved to varying degrees.

This study accepts Folkman and Lazarus' (1980) division of coping into problem-focused (doing something to alter the situation) and emotion-focused coping (reducing the emotional distress associated with the situation). It is acknowledged that Folkman and Lazarus themselves write that neither of these techniques are used in isolation. This division is similar to Roth and Cohen's (1986) concept of approach and avoidance. In general, research supports Lazarus' 1983 finding that emotion focused coping (particularly denial and avoidance) may only be helpful in the short-term or when the situation is completely beyond the individual's control, whereas problem focused coping is particularly useful if the situation is controllable. Billings and Moos (1984) found that

emotion focused coping was associated with a higher degree of dysfunction, and was used more commonly, than problem focused coping. It must be remembered that both emotion focused and problem focused coping are linked to personality as well as situation variables.

Measures of Coping

A review of the current literature on stress and stress-related topics reveals that much effort and ingenuity has gone into devising new measures of the stress process and coping. Voice and speech cues are used to measure emotional change (Scherer, 1987); assessment of cortical negativity (Guttman, 1987, in Appley, 1987) and methods to extract blood samples from humans during their daily activities - called ambulatory recording techniques are described (Frankenhaeuser, 1987). Despite the explosion in physiological measuring techniques, the measures for psychological assessment are multifarious and, on the whole, unsatisfactory. Before even attempting to measure coping properly, we must have an acceptable measure of stress - this is necessary because, if we are to compare different coping strategies we must be able to start with subjects with an equivalent level of stress. In order to see how coping intervenes between stress and outcome, we should also be able to effectively measure the outcome. These two basic prerequisites have not, as yet, been met by social scientists, leaving us trying to understand the dynamics of a process before we understand the internal nature of the individual components, and knowing that we will never understand the individual without grasping the process in which she is involved. A primary problem in this area is the question of what exactly one sets out to measure when trying to assess coping efficacy. A review of studies suggests that three of the most popular indicators are perceived helpfulness (e.g. Berman and Turk, 1981), reduction in emotional distress (e.g. Pearlin and Schooler, 1978) and reduction in problem level (e.g. Menaghan, 1982b). Obviously, the choice of outcome criteria will effect the conclusions about effectiveness of a certain coping technique. Time also plays a role here - certain coping behaviours may have a positive short-term effect and a negative long-term effect or vice-versa; for example, maintaining hope that a missing loved one will be found may be adaptive in the short term, but a persistence of hope, particularly if there are no grounds for belief, may become

With particular reference to coping styles, it is impossible to truly understand an individual's coping strategies without some insight into how parental and other models have influenced the development of these strategies. One needs to understand when, where and how the child developed a value system which provides her with a substrate of coping strategies. These are called upon during the appraisal stages and previous experiences have a formative influence in determining which coping techniques are at the individual's disposal at any given time. The socio-cultural context is largely responsible for determining whether a coping strategy is considered 'appropriate' or not - this is with particular reference to the developmental stage at which the individual is; certain stressors also take on different significance for people of different ages and, of course, for people in different cultures.

Awareness of internal state is another personality factor which may effect the individual in a stressful situation. In the stressful situation, the individual can process information about the stressor itself or about themselves, or about both (Miller and Birnbaum, 1988). It seems reasonable that the individual who is more self-focused will be more able to perceive the internal negative responses to a certain life event and will thus be in a better position to take action to reduce the stress or concomitant anxiety. In contrast, those who do not direct their attention to the self will be more prone to the negative effects of stressors because they fail to perceive and interpret their internal responses and thus not take appropriate instrumental action. This theory is supported by work done by Suls and Fletcher (1985, cited in Fisher and Reason, 1988), but other studies (e.g. Mechanic, 1978) have shown that an increase in attention to the self may increase vulnerability to maladaptive outcomes when exposed to stress. Little attention has been payed to the nature of the stressor itself in the reviews of these contradictory studies (Miller and Birnbaum, 1988), and some clarity may lie in the investigation of the stressor in question. If a situation cannot be influenced by the individual, attention to the self or blunting behaviour may be more appropriate, while in the situation where action is called for, less attention to internal perceptions and more monitoring of the situation may lead to a positive outcome. Research done by Miller and Birnbaum partially upholds this theory; they found that high monitors - people that typically seek

APPRAISAL

The individual needs to appraise the stress if any action is to be taken. The field of psychology is primarily interested in cognitive appraisal, but the body appraises its situation on a biological level all the time. For this reason, we may not be consciously aware of our bodies constantly monitoring and adjusting. If a situation cannot be rectified by the autonomic nervous system, it will become conscious and the individual will move to rectify the situation. However, there may be other demands being made from the environment, as well as our own personal psychological drives which may prevent resolution of the situation or rest until resolution has been reached. In this way, the individual is constantly appraising her way of being in the world and making decisions as regards her behaviour. These decisions will all effect each other - for example, if the individual is constantly fatigued (because her external and internal demands do not allow her to rest), her appraisal of a stressful situation will be significantly altered due to her fatigue. Her behaviour will also be different - because she perceives the situation as more significant or more demanding and because she does not have the resources to call on coping strategies which will require much time and effort. In addition, the presence of an extra stressor will create more fatigue, as will her attempts to cope with the stressor, and her appraisal of her own coping attempts may also be altered due to fatigue or to poor self-esteem (which may, in turn, have been the reason for her refusal to rest in the first place.) In this fashion, a negative spiral will be set up in which the process of appraisal can be seen to play a central role.

FEEDBACK

If the cybernetic nature of the stress response is accepted, the importance of the feedback loop becomes obvious. All three systems - physiological, psychological and social, are activated and maintained through feedback. The individual constantly evaluates and re-evaluates the environment and internal events and makes associations between perceptions, changing behaviours and feelings of anxiety. Here, the individual's predispositions come into play once again as there is room for subjective interpretation of the actual feedback. An example of this is when disapproval of action is misinterpreted as disapproval of self and the individual becomes more anxious and may experience a drop in self-esteem which may, in a circular manner, result in a drop of social support and so the cycle of negative feedback is initiated. In this way, feedback loops allow physiological, psychological and social systems to impact on each other, leading to negative or positive reinforcement and the exacerbation or reduction of stress.

TIMING

As stress is a process, the timing of events will be important in the development and amelioration of the response. The timing of the stressful event in the individual's developmental cycle is an important factor in determining the significance of the stressor, the light in which it is perceived and the resources available for the amelioration of the stressor. It should also be noted that, in the case of chronic stress, the effects may accumulate over time, while in episodic or cyclical stress the presence of recovery intervals may have a positive effect (Appley, 1987). Of course, time is also a factor in the transaction between the physiological, psychological and social systems in that the timing of the perception of stress on each of these levels will determine whether there is any overlap; particularly if the individual is exposed to more than one source of stress at any one time. The level of stressfulness of a given situation may be influenced by the duration of exposure to the stressor as well as the duration of access to support and other factors which would assist coping. Indeed, the timing of the coping behaviour itself may be central to its success or failure. Certain coping strategies may be very helpful if instituted early in the stress process but be useless or even harmful if used later on in the process.

maladaptive after a few years. Similar to the concept of coping, the tests which measure coping abilities can be divided into three broad categories. Some researchers see coping as a defensive ego process (Wolff, 1964; Vailliant, 1977); others see it as a personality trait (Byrne, 1964; Goldstein, 1959) and another school believes that coping is situation specific and so different measures will be taken in response to specific demands. The fact that there is not, as yet, an accepted concept of the coping process will allow a controversy to exist around the issue of measurement.

In this study an attempt is made to measure situation-specific coping strategies rather than consistent coping styles. However, it is unlikely that a composite picture will be formed by looking at an array of situation-specific coping responses in isolation; it is far more likely that the formation or progression of health related problems result from frequent use of ineffective or maladaptive coping strategies. It is also not practical, in terms of research, to attempt to identify each specific situation-response combination as there are an infinite number of these and the results would not form a cohesive whole. Therefore, one tends to look for certain patterns or styles, bearing in mind that changing situations may influence these patterns. Krohne (1989) points out that certain acts or strategies may be helpful in mastering stress in one situation but counterproductive in another situation. The example given by Krohne is that the increased search for stress-relevant information may be helpful when preparing for an exam (Krohne and Schaffner, 1973) but the same behaviour may be counterproductive before surgery (Cohen and Lazarus, 1973). An understanding of situational paramoters is thus vital if the coping process is to be understood. Once a person has contracted M.E. there is limited behavioural control of the fact that the individual is ill, but certain behaviours will improve or exacerbate the illness. Miller's (1980) concept of 'blunting' (avoiding stress-related information) will not render the optimal stress reduction because some degree of monitoring can reduce stress in that the individual can ascertain and avoid behaviours which exacerbate the symptoms of M.E. Also, the fact that the individual is ill can be expected to limit her repertoire of coping behaviour so that coping may become less situation-specific.

The framework of the current study is similar to Dohrenwned's (1982) model of the life stress process. Firstly, he looks at recent events, specifying that the events should have occurred within the year prior to the study. The events could range from major stresses to more usual life events. Secondly, Dohrenwend looks at the individual's ongoing social situation, examining the presence or absence of supportive social networks, noxious work environments, the presence of a chronically ill relative in the home and a variety of other situations which could be referred to as "ongoing difficulties" (Brown & Harris, 1978) or role strains (Pearlin & Lieberman, 1979). Lastly, he examines personal dispositions, including genetic vulnerabilities and residues of remote stressful events. Most importantly, he considers a set of normal personality variables such as attitudes, looking particularly at mastery - helplessness, masculinity - femininity, locus of control, sensation seeking and denial. Although Dohrenwend's standpoint as regards the theory of the stress response is not the accepted framework for this study, his outlines are relevant to the stress and coping process and therefore the biographical questionnaire is designed to gain some insight into these areas.

A problem in the measurement of stress and coping is that it is very difficult to define where the control of events lie and how personal dispositions, social situations and the occurrence of stressful events are interrelated. Methodologically, therefore, it may be less complicated to measure the effects of disasters, because at least in this situation the issue of control of the stressing situation is removed from the tangle of personal and social cause - effect relationships which surround other stressors. In M.E., however, it is very difficult to define to what extent personal factors effect vulnerability to the disease and how the ongoing social situation and the personality are effected by each other and mutually effect, and are effected by, the disease.

In measuring coping, this study follows Folkman and Lazarus' (1980) division between problem-focused and emotion-focused coping attempts. They found that work contexts favour a problem- focused coping while health contexts favour emotion-focused coping; emotion-focused coping is also favoured when the individual appraises the situation as something which has to be accepted rather than constructively dealt with. Emotion-

focused coping appears to be less situation-bound and may therefore be more consistently used across different situations. An important issue when examining emotion-focused coping is that it may be differentially effective if it is used as part of the evaluation or if it is directed at an emotional reaction after the appraisal has taken place. It is widely accepted that problem-focused coping has positive consequences (Frese, 1989, in Appley 184) but a controversy exists around emotion-focused coping. Psychoanalysts believe that emotion-focused coping takes place in the form of repression - which results in the expenditure of energy and often in psychopathology (A. Freud, 1978; Vaillant, 1977). Lazarus (1966, 1982) would postulate that negative emotion, once dealt with, no longer has a negative effect unless another situation evokes them. One of the points on which psychoanalytic and cognitive theory concur is that the relationship between the perception of stress and coping is central; this relationship is highlighted in modern cognitive stress theories and also in psychoanalytic theory where defences influence stress perception. Researchers associated with ego psychology distinguish between "coping" and "defences", postulating that the latter is a less efficient way of handling stress because of its reality distorting nature (Haan, 1977). Krohne (1989) challenges this view, pointing out that this view leads to "an a priori evaluation of coping strategies without taking situational requirements into account" (cited in Appley, 210). It is interesting to note the difference between the conceptualisation of coping as an unconscious personality process (determined largely by childhood experiences) (Freud, 1946) to the perception of coping as a skill or an ability which can be learned or improved through cognitive and behaviour modification.

Frese's (1989) review of the action theory perspective is interesting. This perspective is based on the premise that human beings turn conscious attention to things only when it is necessary. So a conscious attempt to evolve a coping strategy will only be made if habitual coping behaviours are not effective. The use of this new coping strategy will require effort whereas the habitual coping strategies, which operate out of the unconscious, will require very little effort. The implications of this perspective for the measurement of coping responses are considerable because it implies that only consciously used (and thus problematic) strategies will be reported unless indirect measurement of

coping is used. This implies that measured (or conscious) coping strategies will be related to psychological dysfunction.

It must be noted that there are numerous references to "successful coping strategies" in the literature; this implies that there is one specific goal towards which all coping strategies are aimed. I do not believe that this is the case - there may be several goals. Broadly, coping strategies may aim to regulate the actual stressing event, to regulate information received, and to regulate the emotional response; there is variation within these categories and they all interact with each other. With the exception of a few extremely maladaptive methods of coping (for example paranoid distortion) it is almost impossible to predict whether a coping behaviour will be effective in mastering the situation or not. This highlights the individual differences between subjects and the complexity of the coping response.

Vaillant (1976) ranked coping styles in terms of their maturity, thus moving away from an assessment of the actual outcome and arguing that some styles are preferable to others simply because they are intrinsically better through achieving a higher level of maturity. In a similar vein, Haan (1977) assessed the ego processes as either adaptive or maladaptive and, from this assessment, drew predictions as to the nature of the coping response. This led to the development of a detailed set of criteria concerning maturity, with adaptive coping characterized by relative freedom from reality distortion, flexibility and future orientation. These criteria are carried over from psychoanalytic theory where Haan argues that "unrestricted, undistorted communication with the self, others and the world is the unacknowledged core of psychoanalysis." (Haan, 1981, 161). An argument against Haan's stance is that less rational, more distorted assessments may actually be useful in some situations; her theory tends to sweep over the importance of the actual situation in determining which coping effort will be the most effective. Rosenstiel and Roth (1981), for example, find that denial under certain circumstances is associated with better outcomes and Hansen and Johnson (1979) hold that misperceptions may make it easier to deal with problems. There is also a problem with the

concept of maturity, the very definition of which necessitates a subjective value judgement on the researcher's behalf.

The question of 'what is adaptive' remains unanswered - in fact Barofsky (cited in Kaplan, 1983) maintains that what is adaptive varies by domain, situation, time period and measurement choices and concludes that the core question may not be completely answerable. However, this study is more concerned with the maladaptive effects of certain coping strategies, particularly those which result in a relapse of M.E. For this reason, time will not be devoted to the discussion of coping goals and what could be construed by the subjects or the writer to be successful attainment thereof. The research design allows for the correlation between the use of certain coping techniques and the relapse of illness. Thus the results of certain coping strategies will be split into the three broad categories of social, psychological and physiological and the study will look at each area within the parameters of the General Health Questionnaire.

The Role of the Situation

Central to the understanding of the efficacy of different coping strategies is an understanding of the controllability of the situation. This concept has been researched in several studies (Glass & Singer, 1972; Averill & Lazarus, 1972). In a review of these studies, a central premise comes to light - that there is a distinction between behavioural control (controllability) and informational control (predictability). Combining these with the assumption that each situation is either possible or impossible to control, we see that there are four types of situations with different control patterns. A given coping strategy will have differing efficacy in reducing stress depending on the nature of the strategy and which of the four control patterns is encountered. The relevance of this theory for the current study is obvious - taking the coping strategy of monitoring as an example, we see that the M.E. sufferers may attempt to gain information about the stressing event and then influence the stressor. But the information gained appears not to be helpful in controlling the stressor, resulting in failure, frustration and possibly an exacerbation of the stress load. Menaghan (1982a; 1983b) asserts that the severity of the problem exerts a strong influence on coping usage. In her research on coping efforts in

the assessment stage, she found that optimistic comparisons and direct action were less likely to be utilised if the stressor was severe; subjects undergoing severe stress were more likely to turn to selective inattention or restriction of expectations. It should be noted that the phase of the stress event in which the coping strategy is applied is also important, the same strategy may have different results if it is applied in the preparation, confrontation or post-confrontation stages (Krohne, 1989). In the case of responding to the stress of having M.E., there is little chance that the peak of stress arousal will occur in the preparation stage because there is no distinct preparation phase and, even if there were, organised behaviour would not be of assistance in ameliorating the pending disease. For this reason, the stress arousal peak may occur in the middle of the confrontation stage; this will interfere with any adaptive behaviour and may feed back physiologically and psychologically into the system, thereby worsening the disease and resulting in a cyclical increase in stress.

Coping and Perceptions of Control

A sense of control is important in dealing with a stressor - this may operate on several levels. It may be a buffer during the initial assessment phase and it can reduce negative emotions throughout the stress process by enhancing self-esteem and increasing hopefulness. Attempts to gain control may be directed towards the situation itself, or they can be directed inwards, at controlling the emotional or intellectual responses to stress. The situation can thus be controlled directly or through a change in perception or attitude. Feedback loops play an important role in both physical and emotional control as they provide a method of monitoring the onset and progression of various mental and physical symptoms. A sense of control may also lead to more effective performance. It should be noted, however, that a sense of control appears to be effective only in situations where some control over the stressing event is actually possible. If action is not possible, an attempt to control the situation can actually lead to negative consequences (Breznitz, in Appley,1987, 295). Hope and positive outlook, on the other hand, can have a positive effect on the health of people under stress regardless of whether control is possible or even if the situation is objectively hopeless. Closely related to a sense of control is the need for the individual to make an active commitment

to a project or cause of some description. The positive effects of this are anecdotal (for example, accounts by concentration camp survivors) and have been upheld by research (Totman, in Fisher and Reason, 1988). Other research supporting this view is the work done on unemployment (Brenner, 1979; Levi, 1987) and on loss and bereavement (Bowling, 1987).

Interindividual Differences in Coping Strategies

Although the emphasis in this study falls on situation-specific coping styles, it is also vital to understand what the individual brings into the situation. It is obvious that some individuals will be more vulnerable to a stressor if they are in a certain place in terms of biological, psychological, social and temporal variables - all of which interact at the time at which the individual is exposed to the stressor. These variables are summed under the heading 'predisposition' in much of the literature on stress and coping (Appley, 1987).

Physiologically, predisposition develop from genetic, prenatal, developmental and nutritional histories of the individual, as well as previous illnesses and inherent physical weaknesses and strengths. The individual may also effect a physiological predisposition through training and habituation or taking drugs, not caring for good health and pushing the body to fatigue. Of course, the fact that the individual chooses to behave in a certain manner cannot be understood without an understanding of psychological and social factors. Psychological predispositions also arise from the individual's past, including past successes and failures, coping techniques learned, self-esteem, attitude, intelligence (to a certain extent) and the temporal timing of the stressor in relation to the developmental cycle. A considerable amount of the research on personal resource variables has looked at locus of control and sense of mastery. Turk (1979) found that adjustment to illness was positively correlated with a sense of personal mastery and a number of studies have found that the perception of events as controllable is associated with less adverse outcomes (Johnson and Sarason, 1979; Pearlin et al, 1981).

out threatening information - show greater physical and psychological morbidity in response to uncontrollable stressors than the matched group of low monitors. Once again, it appears that both the nature of the event and the capacities of the individual in question are important; it should also be noted that certain individuals may have the social competencies and personal skills to deal with some events and not others - the match between the individual's predisposing coping style and the requirements of the event is very important. As the individual perceives the mismatch between what is required and what she is able to do, her perceptions of herself as a competent actor in the situation will be under pressure (Bandura, 1985) and she may begin to engage in inflexible and seemingly maladaptive behaviours.

In understanding why certain individuals react to situation in certain ways, it is helpful to understand exactly what is perceived as being threatened for the individual in the situation. Kaplan (1975, 1980) posits a universal desire to maintain self-esteem; from this viewpoint he goes on to examine how different coping strategies serve to maintain self-esteem or a sense of coherence in the world. The idea that certain strategies are adopted in order to perpetuate or re-affirm vital beliefs about the self is an interesting one. It may shed some light on the question of why certain coping strategies are developed in the first place and why they appear to be adaptive for some people and maladaptive for others. It also complicates the examination of stress and coping as it necessitates an understanding of each individual's conscious and unconscious needs.

Summary

In response to the debate as to whether coping strategies are a function of the individual's disposition or situation-specific processes, it is postulated that the two theories are not mutually exclusive and that they work as functions of each other. Appley (1987) points out that individual factors are important in understanding the relevance and significance of an event but the "significance of context, as should be clear, lies not in the situation, as such, nor in the individual, but in the interaction (or transaction) between person and event" (Appley, 1987, pg 314). Folkman and Lazarus (1984, pg 288) state that "the assessment of coping traits actually has very modest predictive value with respect to coping processes", and Menaghan (in Kaplan, 1983) ...esses that caution is called for in generalising about coping usage patterns. However, an understanding of the importance of perception in the stress response is vital in this regard. Although there is widespread agreement that the choice of coping strategy is dependent on the situation to a certain degree (Krohne & Rogner, 1982; Miller, 1979 a), it cannot be denied that dispositional characteristics will have a large effect on how the situation is subjectively perceived and how the individual perceives her own ability to cope with the perceived demand. For this reason it is postulated that an understanding of the individual's cognitive processes (rather than their 'coping traits') would be valuable in gaining insight into why certain coping strategies are employed and why these strategies may be effective for one individual and not for another. This study looks at these cognitive processes within the overall focus on situation- specific responses.

COPING TECHNIQUES

Learned Resourcefulness and Self-Regulation

First described by Meichenbaum (1977), the term learned resourcefulness has been coined by other writers in the field (eg Rosenbaum, 1988) to describe the management of stress. Meichenbaum used this concept in a program undertaking to train people in cognitive and behavioural skills which would enable them to cope with stressful situations more successfully. The areas in which he intervened were those of self-monitoring of maladaptive thoughts, images, feelings and behaviours; problem-solving skills and emotion regulation and other self-control skills. Rosenbaum terms this program a 'stress inoculation program' and adds the ability to delay immediate gratification and the general belief in one's ability to self-regulate internal (emotional and physiological) events. He also uses the concept of a personality repertoire, which he defines as a set of behaviours, cognitions and affects which are in constant interaction with the social and physical environment of the person (Rosenbaum, in Fisher and Reason, 1988). These factors are seen as interactive, so the personality repertoire of an individual can be an independent or dependant variable, and it will be the nature of the personality repertoire that will determine the individual's attempts at self-regulation. Self-regulation will be called upon when the reflex or automatic responses to certain situations are interrupted, are inadequate or unavailable, or when several response sequences of nearly equal probability are in conflict (Kanfer, 1986). The conditions which activate the self-regulatory process are similar to conditions termed 'stressors' by other researchers, and Rosenbaum suggests that the self-regulation process follows three stages of representation, evaluation and action.

The basic constructs in this theory follow the models set up by Folkman and Lazarus (1984) and McGrath (1976), but a few interesting variations occur. Firstly, Rosenbaum suggests that the trigger for the self-regulatory process is one of 'interruption'. This follows Mandler's (1982) postulation that the most psychologically stressful situations are ones in which certain situations interrupt the sequence of habitual acts or thoughts;

this interruption triggers an autonomic arousal reaction and a cognitive evaluation of the arousal process. Rosenbaum emphasises that this evaluation is conscious and his description of the evaluation process is synonymous to primary and secondary appraisal as outlined by Folkman and Lazarus (1984). Rosenbaum suggests that different traits within the personality repertoire will have an effect on different stages of the stress response. Using Antonovski's (1979) definition of 'coherence' (confidence that the internal and external environments are predictable) and Kobasa's concept of 'hardiness' (viewing disruptions as challenging and desirable), Rosenbaum (1988) theorised that learned resourcefulness does not play much of a role in the representation and primary evaluation stage of stress arousal, but it is important in the action phase, while individuals with a high sense of coherence and hardiness may fare better in the primary appraisal of the stressor. Individual traits within the repertoires such as 'hardiness' and 'sense of coherence' have been examined (Buss, 1980, Antonovsky, 1979; Kobasa, 1979) and it is thought that individuals with a high sense of coherence will evaluate stressors in a more positive light, and expect their internal and external environments to maintain a level of predictability. Hardy individuals (Kobasa, 1979) will view the situation as a challenge rather than a threat. Both of these factors intervene in the initial appraisal stage, while other aspects of learned resourcefulness may come into play when the individual sets about actually dealing with the stressor.

In terms of secondary appraisals, the relationship between self-efficacy beliefs and ability to cope with a stressor is not clear. Rosenbaum (1988) reviews the literature on this area and concludes that learned resourcefulness only influenced self-efficacy expectations if the individual had previous experience with the stressful task. But he postulates that learned resourcefulness plays a large role in the action or coping phase of the stress response. He points out that, although the individual's assessment of the situation is an important determinant of whether or not she will be able to cope with the stressor, without the appropriate repertoire of coping skills (i.e. learned resourcefulness), coping attempts will be ineffective. Rosenbaum (1988) holds that high resourceful subjects were more likely to use self-control methods than were low-resourceful subjects.

Self-regulation itself can be further categorised into corrective and anticipatory self-regulation. Rosenbaum's studies cited thus far have been concerned with corrective self-regulation, but Kanfer (1986) points out that anticipatory self-regulation can also occur. He defines this as when the individual recalls information that disrupts a planned or habitual behaviour - in this way the disruption is self-generated. Nerenz and Leventhal (1983) call this type of behaviour 'danger control' and they describe it in relation to illness. Individuals objectively present the health threat to themselves and make plans for reducing or modifying the impact of the threat before it actually occurs. So, when an individual engages in anticipatory self-regulation, she delays immediate gratification in favour of a positive long-term outcome. A high level of resourcefulness is associated with the use of both anticipatory and corrective self-regulation (Rosenbaum, in Fisher and Reason, 1988).

Rosenbaum (1988) theorises that learned resourcefulness is acquired during the informal learning processes during childhood. This idea is similar to the idea of ego resiliency put forward by Block and Block (1980), and is also seen as a stable personality repertoire which is built up in early childhood. Rosenbaum stresses the importance of the ability to adapt to changing circumstances and be flexible in problem-solving techniques as well as to delay immediate gratification, but does not go on to explain exactly what type of parenting and/or early environment is most conducive to the development of resourcefulness at an early age.

As regards the importance of social support as a moderating factor, Rosenbaum (1988) argues that individuals who are high on resourcefulness will be most able to help themselves and more likely to be helped by others in the event of a stressful situation arising while low resourceful people will deplete their social support reserves by their socially dependent behaviour and are thus less likely to be helped when social support is required. This hypothesis is supported by Monroe and Steiner (1986), but no mention is made of the differing social support offered traditionally across difference nationalities and race groups.

Predispositional factors can be important in terms of coping behaviour. Certain techniques may have been learned which will allow the individual to deal with the stressor in an adaptive fashion before it even becomes a stressor. This helps to explain why certain individuals will perceive certain events as stressful while others do not appear to be phased by the event at all. Appley (1987) takes this point a step further and holds that a response may be triggered in the individual when there is a 'match' between a provoking agent and the source of a predisposed, stress-related response. The individual's predisposition may also be important once she is engaging the stressor in that certain coping strategies will be used and, if they are ineffective, an attempt to formulate new strategies may be made. The strategies used will depend to a large extent on the physiological, psychological and socio-cultural background of the individual as well as on the characteristics of the demand and the manner in which the demand and the individual's predisposition interact.

It is accepted that the dynamics within the physiological, psychological and social systems act individually and collectively to provide an ongoing state of 'health' for each individual. If a vulnerability is present, there is some degree of coincidence or 'luck' determining when the individual comes across a stressful situation which 'matches' her vulnerability. Should this occur, the three systems interact continuously to determine whether the individual can adapt to, or cope with, the stressor. If the process is conceptualised in this manner, it highlights the fact that research into the relationship between stress and health persists in looking at the individuals who do not have a solid foundation of 'health' - because these are the people who contract diseases and show maladaptive reactions. Perhaps the answer to the riddle of health can be found just as easily through studying the healthy as it can be through studying the diseased. but if research in this area focused on healthy people, some very different theories may be formed.

It has been hypothesised (Averill, O'Brien and DeWitt, 1977) that different individuals have characteristic coping strategies and different potentials in terms of learning effective coping techniques. In other words, the subjects who showed non-optimal coping

strategies in the study carried out by Averill et al were those who carried out rigid behaviour patterns, regardless of whether this was appropriate according to the situation. Another group also showed non-optimal behaviour, but their behaviour was unstable (random) rather than rigid. Krohne (1989), commenting on Averill's study, suggests that there are four modes of employing coping behaviour - a rigid, vigilant mode (subjects try to attain informational and behavioural control of the situation, a rigid, non-vigilant mode ("repression"), a flexible use of coping strategies and lastly a mode characterised by unstable behaviour. Krohne sees the coping mode as the link between coping dispositions and actual coping behaviour. Averill's hypothesis is accepted in this study and the rigidity of the subjects' coping patterns will be monitored and correlated with the various measures of dysfunction.

In the current research an attempt is made to access the primary and secondary appraisals made by the subjects when faced with a stressful situation. No attempt is made to analyse the pre-conscious stage, although this stage is connected to the individual's perception of herself in the world and it may hold important insights into the connection between mental state and disease.

Self-Handicapping

Jones and Berglas (1978) define a self-handicapping strategy as a form of defence mechanism whereby the individual reduces a threat to self-esteem through having a impediment to performance to which the individual may ascribe her failure. This impediment may actually be unattractive in itself (for example being an alcoholic (Snyder and Smith, 1982)) but it is still regarded as adaptive as long as what is lost through the use of handicapping is not as valuable as what is protected. Other self-protection strategies include self-serving explanations, and self deception, in which the individual herself is also deceived.

The Psychosocial Context.

The role of the environment and the individual's social support network cannot be overlooked in an analysis of coping strategies. This is indicated in the work of theorists such as Dohrenwend and Brown (1984, in Appley, 257). Broadly defined, 'social support' can include anything from financial aid, social services and availability of commercial services to consultation with a psychotherapist. The field is further confounded by the fact that the existence of social ties is a necessary, but not sufficient, condition for the existence of any kind of relationship. Social support has been found to buffer against negative health consequences of stress in many studies; having positive effects on numerous disease states as well as the amount of medication required by ill people, their compliance and speed of recovery (Cobb, 1976). Singer & Davidson (in Appley, 1987,) postulate that, even in nonstress situations ('nonstress' referring to very low stress situations), individuals who have some social support fare better than those who do not, and social support itself is positively correlated to good health. This good health may, in turn, minimise the effect of stressors in the environment. In addition to this, the presence of strain in the individual may lead to a decrease in social support (both offered and/or perceived) and this may be the primary causative agent in the relationship between high strain and low social support. The link between stress and social support is further confounded by the fact that certain stressful situations - such as an ongoing debilitating illness like M.E. - may actually lead to the degeneration of social support systems. House (1981) postulates a division of social support into emotional support (behaviour that transmits trust and love), esteem support (resulting in information necessary for self-evaluation), instrumental support (bringing goods and services) and informational support. These categories are helpful in attempting to define the parameters of 'social support' but the individual's perception of the act must not be ignored; a significant other may engage in what is intended to be supportive behaviour, but actually upset the individual further; for example by denying feelings of grief and anxiety that the individual needs to deal with or by disturbing a process of selective denial which may be the only way to make the situation bearable. The support provided must also match the needs of the recipient if it is to act a a buffer.

The definition of social support and the outcome of studies concerning it will undoubtedly be effected by the perspective from which the researcher views social support. Berkman and Syme (1979) found that long term mortality predictions could be made from an in-depth study of the individual's social ties, with particular emphasis on the number of ties as opposed to the quality thereof. Gentry and Kobasa (1984), on the other hand, found the subjectively perceived quality of the relationship to be of importance. Hatfield (1984) argues that intimacy has three dimensions - cognitive, emotional and behavioural - and that all three of these factors will influence an individual's ability to confide in another, feel intense emotions toward the other and engage in comfortable physical contact. Studies (Lowenthal and Haven, 1978; Lefcourt, 1985) have shown the presence of a balanced intimate relationship to be important to patients' physical and emotional well-being. For this reason, insight into the social support available to the subjects on the study is necessary. An important area here is that of self-esteem and Brown postulates that our image of ourselves as worthy of support and the actual support offered by those around us are mutually interdependent. Taking this theory a step further, however, it would be possible to postulate that the exact causal relationship between the presence of a social support network and the mediation of stress cannot be defined. An individual who has an effective social support network may appear as if this network is acting as a buffer against stress, but there may be some personality factor which underlies both the fact that the individual is able to build up a social support network and that he does not show maladaptive behaviour as the result of exposure to a stressor. In the same vein, failure to cope with a stressor may be for the same reason as the individual failed to build up a social support network, rather than because the network was not constructed.

Winnubst, Buunk and Marcelissen (in Fisher and Reason, 1988) write that relational competence may effect social support through at least four difference processes. Characteristics such as sociability, assertiveness and extraversion may contribute to the ease with which relationships are built while tolerance of intimacy, emotional stability, cooperation, sensitivity and empathy may effect the development and maintenance of relationships. The individual's conceptualisation of the relationship is also important

should that relationship be called upon to provide support - individuals with cynical, negative and pessimistic attitudes towards relationships may have difficulties forming ties and may not perceive those relationships as a possible source of support. Lastly, the individual must be able to employ the relationship in times of need - Hansson (1984) finds that people with low social anxiety and high self-esteem may find it easier to solicit supportive behaviour from others while depressed and neurotic people may turn others away (Sarason and Sarason, 1985b).

Under situations of stress, affective barriers to accepting support would include feelings of shame and guilt - especially if the individual feels that she could somehow have influenced the course of events - as well as feelings of low self-esteem and vulnerability.

It must be noted that most of the literature linking social support and health is based on reports concerning perceived support. House (1981) and Turner (in Kaplan, 1983) suggest therefore that the term 'social support' be defined in terms of the experience of being supported rather than the objective level of material assistance or adequate resources. Brown also finds that depression can be predicted in situations where there is a match between a severely stressing event and an ongoing conflict of roles and relationships (such as is seen in working mothers). Although Brown & Andrews (1984) study the relationship between depression and social support, their finding that self-esteem plays a central role is an interesting one. Looking at the role of relationships, they found that good experiences in current core relationships could be more important than previous relationships and that good current relationships could actually help to neutralise the past. These findings are supported by Quinton & Rutter (1984). Good current relationships appear to act as a buffer against hopelessness - a condition which is not seen as conducive to effective coping (Brown & Andrews, 1984; Breznitz, 1987). In addition to how the significant others around the stressed individual view the situation and offer support, the effects of their own coping mechanisms must also be examined. The interaction between these two or more sets of coping techniques may be productive; providing positive reinforcement and stimulating a mutual attempt to resolve the problem. On the other hand, approaches may clash and undermine each other, resulting in added stress and a drop in perceived support.

The socio-cultural system in which the individual finds herself thus has a direct impact on coping techniques through variables such as social support. It also has an indirect impact through its role in the formation of the individual herself. Both self-evaluation and personal values have some social origin and the social context also has a part in defining situational constraints and normative expectations. These factors are largely responsible for the formation of the individual's expectations about herself and her environment and her definitions of success and failure. If the importance of individual perception in the stress process is recognised, these factors cannot be overlooked. In fact, several authors have suggested that operational confounding exists between social support measures and stressful life events. This argument holds that the feeling of being loved and esteemed and socially valued is so important that the health impact of loss events may derive more, or at least as much from, the loss of support as from the associated stress (Mueller, 1980; Schaefer, 1981). This theory has been postulated by theorists examining the response to death and dying - the possibility is that the mourner grieves for the loss of a loved one as well as for the loss of love and social support. This confounding variable casts a shadow on the already dubious use of life stress questionnaires and highlights the fact the social support cannot be empirically separated from psychological distress, thus making the relationship between the two very difficult to understand.

Broader Demographic Factors

Factors influencing the perception of a stressful event include the presence, and strength of, cultural and religious values and norms and social class. Eisdorfer (1985) points out that the social climate is an environmental factor which may play a role in the mediation of stress. Certainly, it is conceivable that factors such as social prejudices and social expectations could influence the individual's perception of the stressful situation; they would definitely have an effect on the previous experiences of the individual and on her learning of acceptable coping responses. Cultural belief systems and accepted attitudes towards change and specific stressors are also important. Prejudices and expectations may increase the 'load' which the individual is carrying on entering the situation, thereby increasing the gap between capability and demand. They may also have an effect on the

resources and support available to assist the individual in bridging the gap. Most individuals form part of an organisation at some level, and the size and structure of that institution as well as the extent to which the individual subscribes to the values of the system, will have an effect on the role of the institution in ameliorating or exacerbating the stress. A stimulus in the environment may be the primary stressor, but the effect of the environment may be more subtle through contributing to the 'background noise' in the individual's life. Social injustice, war or economic recessions will contribute to the day-to-day stress experienced by the individual, influencing her perception of the world around her and her feelings of personal control.

Some researchers feel that a higher level of education is conducive to better coping. Reasons for this hypothesis include that better educated people fare better in realistic stress perception and have better problem-solving skills because they have a higher level of cognitive complexity (George, 1980, cited in Kaplan, 1983). They may also deal with complexity and novelty better, have more positive self-perceptions (Shanan et al. 1976) and have greater intellectual flexibility (Kohn and Schooler, 1978). Pearlin and Schooler (1978) found that being male, better educated, currently married and having a higher income were associated with a higher sense of personal mastery. These findings were confirmed by Pealin et al. (1981), Kessler and Cleary (1980) and Eron and Peterson (1982). Socioeconomic status may be related to the method of coping used; an example of this in the area of assessment of the stressor is that people of a higher socioeconomic status are more likely to make optimistic comparison between their own situation and that of others. They are also more likely to use direct action as a coping technique and less likely to use selective inattention and restricted expectations when appraising the stressor (Meneghan, 1983b, in Kaplan, 1983). Menaghan goes on to postulate that socioeconomic status shows more correlation with generalised coping resources than to specific coping efforts. These findings may not be generalisable to M.E. sufferers attempting to deal with the stresses of their illness as they are unlikely to meet with much success using direct action and, as health-related problems are usually regarded as quite a severe stress, they are less likely to use optimistic comparison.

It is important to note that the population from which the subjects for the current study were chosen consists predominantly of middle-class, educated people. This trend is one which has been noted by M.E. researchers - as can be seen by the coining of the name "yuppie 'flu" by the media. There are a number of possible explanations for this phenomenon, one of which is that higher-functioning people perceive the drop in their performance more severely in their day-to-day activities than a person in a less demanding position would, and are thus more likely to seek medical attention. Another theory is that the people who contract M.E. are usually those with a high level of responsibility and are functioning under stressful conditions in their employment. Of course, this need to achieve is, in turn, motivated by underlying personality characteristics which may themselves contribute to the onset of M.E. Perhaps it is only the individuals in a higher income bracket who can afford the expenditure and time that it takes to pursue their illness up to the level of a specialist - which is essentially what the clinic for M.E. at the Institute for Virology is. Linked to this, there may be a number of factors in the relationships between these individuals and their family doctors which lead to the referral of the patient to the clinic. As regards poorer, rural populations, with particular reference to the Black population, there are a number of differential diagnoses which could explain an ongoing feeling of fatigue - for example bilharzia, dysentery and typhoid - some of which the patient will have suffered in the past and so blood tests will be positive and a diagnosis may be made in the light of the patient's medical history. So we cannot exclude the possibility that there are people from all socioeconomic groups who suffer from M.E. The point is that the people from other groups cannot be accessed in a study such as this because they do not, for a variety of reasons, reach the population from which the sample is selected.

NEGATIVE EFFECTS OF COPING

Thus far, very little mention has been made of the possible negative effects of coping. Schonpflug (1985) and Cohen (1986) suggest that the inclusion of the possible negative effects of coping will lend sophistication and validity to the concept. On a most basic level, it is obvious that attempts to cope which are unsuccessful not only tap the individual's resources to no effect, but failures can actually become a stressing factor in

themselves. Failure may follow inaccurate cognitive appraisal of the self; the demands made by, and resources offered by, the environment; inappropriate goal setting; bad strategies, inefficient execution of good strategies or misinterpretation of feedback signals. If failure to cope persists, it can become a source of threat and loss in itself. Problems may arise as the consequence of certain coping strategies which can also become stressors in themselves. Further problems may arise if the individual does not have sufficient time to recover between coping attempts - as is the case when faced with a chronic stress. Ongoing coping will deplete energy and other sources of support. On the other hand, the experience of using one's coping resources may be positive. Zuckerman (1980) uses this theory to explain the enjoyment derived from sports such as mountain climbing or sky-diving, where the individual's ability to cope exceeds the demands made by the situation. Successful coping reinforces the individual's sense of control and positive feedback stimulates the learning process. In the current study, the occurrence of these feelings of accomplishment and triumph are monitored through the use of a Likert Scale.

Interestingly, Billings and Moos (9184) report that coping and social resources did not have a buffering effect against dysfunction. Findings such as these demonstrate the complexity of the coping procedure and remind us that measurable coping behaviours may be more indicative of impending pathology than amelioration. When the long-term analysis of the effects of these stressors show that they have resulted in health-related problems, it gives the false impression that the coping behaviours were ineffective rather than that the stressor was problematic in the first place. This does not invalidate the use of coping strategy questionnaires but rather shows that they must be understood to show the correlation between problematic coping strategies and psychosomatic complaints.

SUMMARY

Stress cannot, and should not, be avoided. The best form of dealing with the distress which follows stress is through prevention. Any method of keeping the balance between demand and capacity may be beneficial, as would any strategy to bolster self-esteem, to

reinforce social support networks and positive, hopeful attitudes and encourage self-development with particular reference to the development of coping strategies. Rigid coping mechanisms are maladaptive, as are attempts to control uncontrollable events. Coping techniques should ideally be related to the situation in which the individual finds herself. This study accepts the division between emotion focused and problem focused coping attempts, with the latter showing more stability. A stressful event should be understood as a dynamic process during which the individual may experience apparently contradictory states of mind and use different coping mechanisms at different stages of the encounter.

HYPOTHESES AND AIMS

From the literature reviewed on the relationships between stress, coping and disease, the following hypotheses have been made by the writer.

1. Denial is expected to be positively correlated to poor general health, while problem-focused coping (associated with higher learned resourcefulness) should have a low or negative correlation with poor general health.

2. A positive relationship is expected between poor general health and harm - loss primary appraisal.

3. A positive correlation is anticipated between feelings of hopelessness and helplessness and poor general health.

4. Lack of control over the situation in which the individual finds herself should be positively correlated with poor general health.

5. Attempts to control uncontrollable events should be positively correlated with health complaints.

6. Low levels of self focus are expected to correlate positively with poor health.

7. The negative effects of the situation on the individual's state of health should be ameliorated by the presence of a good personal relationships and a positive perception of social support.

8. The subjects should adapt their coping style to the situations in which they find themselves.

9. As the stressful situations that the subjects report will vary over the 9 month period, a consistent pattern of coping mechanisms should not be set up.

10. The primary and secondary appraisals should be situation specific and should correlate positively with each other.

11. In terms of the coping mechanisms used, acceptance of the event as uncontrollable in the process of primary appraisal should be positively correlated with the use of emotion- focused coping, while the perception of the event as controllable should correlate positively with the use of problem-focused coping.

The hypotheses set out above refer to "normal" coping behaviour i.e. coping that is considered adaptive in the literature. However, the current study looks for variations from the norm. From the correlation coefficients and factor analyses run on the data, abnormal coping patterns will be sought and these patterns may be related to a decrease in general health.

RESEARCH DESIGN

At the outset of this section, a comment must be made on the relationship between statistical associations and causality. If statistical correlations between certain ways of coping and the relapse of M.E. are found, it does not prove that these two variables are causally related; there may be a third factor intervening and influencing the incidence of both factors. Even if they are causally related, the direction of the cause - effect link is not known.

Subjects

A sample of eighty women was accessed through the Institute of Virology, Johannesburg, and were followed in a longitudinal study extending over nine months. Based on information obtained from the Institute's files, subjects were matched for ageand sex. They were all woman between the ages of 18 and 60 and they had all contracted M.E. within six years prior to the onset of the research. They were also all resident in the Witwatersrand area - this was a necessity in terms of cost of travel and logistically as ten interviews were to be conducted by one interviewer in one day.

The selection of the sample began by letters requesting participation being sent to all 132 women who fell into the appropriate population from which the sample was drawn. The letters explained the nature of the study and 80 women agreed to join the study. Nineteen women returned the form marking that they would not be able to participate in the study; three of these gave the reason that their health was not good enough and three because they would be out of Johannesburg for a significant portion of the period of the study. Four replies indicated that the women were moving away from the Witwatersrand area. Seven of the respondents did not specify why they were unable to take part. Two women replied that they would take part in the study but their replies were too late for them to be included, and one subject wished to participate but passed away between the completion of the forms and the receipt thereof. This leaves thirty women who did not reply to the initial call for participants. Of these 30, 12 letters were

returned by the post office as the addressees were no longer at the given address. Thus eighteen of the possible population (13,6%) were non-compliant in that they were unable to participate and unwilling to complete the form explaining their reluctance. This biases the sample somewhat, in addition to which the sample does not include the people who travel extensively or move frequently and any factors related to these characteristics (for example, economic status or nature of employment) will not be accurately represented in the sample that was drawn from the population.

The drop-out rate on the study was low, particularly considering the poor physiological condition of the subjects. After the second set of interviews, three subjects dropped out and after the third, five dropped out, leaving seventy two subjects completing all four interviews. It should be noted that the biographical details and test results from those interviews completed were used for all subjects, including those who dropped out.

Procedure

The study was structured as a longitudinal study, the purpose of which was to follow the subjects over a period of nine months and monitor the stresses to which they were exposed, the way in which they appraised those stressors and coped with them, and their general health over that period. No control group was set up because the appraisals and ways of coping used by the subjects were compared to conventional norms and expectations as reviewed in the literature; internal comparisons were also made - i.e. comparing how the same individual adapted their coping technique to suit the new stresses experienced over the nine month period.

Initially, each subject was required to fill in a detailed biographical questionnaire. Thereafter, each subject was tested every eight weeks over a period of nine months, thus allowing four tests for each subject. In each of the fours tests, the subject completed a battery of three questionnaires; these questionnaires accessed:

1. Primary and secondary appraisals.

2. Ways of coping

3. The subjects' general health over the past eight weeks was monitored with the General Health Questionnaire.

Before completing the battery of questionnaires, the subjects were asked to list the stresses experienced over the last eight weeks and to choose one of these stresses on which to answer the questionnaires. Specific details of the chosen stressor were requested.

INSTRUMENTS

Primary Appraisal Scale

The assessment of primary appraisal was carried out using Folkman and Lazarus' (1980) primary appraisal scale, consisting of 15 emotions, grouped into three subscales, measuring primary feelings of challenge or confidence, harm/loss or anxiety and depression. Responses were scaled on a 0 to 4 scale for each stress reported.

Clinical observations in the mid-sixties lead medical professionals to suspect a relationship between the incidence of negative life events and subsequent physical illness. Holmes and Rahe (1965) structured a scale with which they measured the Life Change Units, but they failed to take individual background and perceptions into account. There has been a move towards understanding the personal meaning of each event in more recent literature (e.g. Brown, 1974) but this type of analysis relies fairly heavily on interviewer intuition and is time-consuming. No life-stress questionnaire was administered to this sample of M.E. sufferers as an attempt to gain insight into the events occurring before the onset of the illness would be extremely difficult, especially if the onset was more than a year prior to the study. In addition to bias in recall, the subjects have all suffered a major illness between the life stress (if there was one) and the questionnaire - this illness is bound to influence recall and perception of the event. The critical link is the individual perception of the event and the way in which the impact was ameliorated through the use of coping mechanisms. Also, a simple documentation of the stresses without an extensive investigation of control groups will not give much insight into why these individuals have contracted M.E. while other individuals exposed to similar stresses have not. Also pertinent to the use of life stress questionnaires is the question of whether significant life changes precede the onset of illness (thus implying a causal relationship) or follow the onset of the illness (implying a resultant relationship). Rahe and Arthur (cited in Monat and Lazarus, 1977) suggest that these two situations may be equally common, but it is an important question to answer when dealing with an illness such as M.E. which has a great potential to disrupt the lifestyle

of the sufferer and those around her. For all of the above reasons, the current study enquires about stresses experienced prior to the onset of the illness as a small part of the biographical questionnaire and the results are recorded for interest and perhaps as a guide to future research, but they are not the focus of the analysis or discussion.

Although measurement of dispositional factors has been acknowledged in the literature review as important, a single-minded approach assumes consistency of behaviour and belittles the importance of the situation in determining the coping response. Also, measurements of coping dispositions have not proved to predict actual coping in the situation (Cohen and Lazarus, 1973). The methodological problems associated with an attempt to retrospectively measure stress experienced in childhood have been discussed. Consequently, no measures for stresses experienced in childhood were included in the study, though many theorists would argue that the ongoing effect of early childhood experiences cannot be ignored. Although questions were not directed towards childhood experiences, it was noted that many of the interviewees volunteered information about their childhood.

Questions regarding the nature of stresses experienced before the onset of M.E. were included in the questionnaires, but documentation of these stresses is not relied upon as a source of insight into why these individuals have contracted M.E. while others exposed to similar stresses have not. The critical link is the individual's perception of the event and the way in which the impact was ameliorated through the use of coping mechanisms. For this reason the emphasis falls far more heavily on the stresses experienced during the nine month period of the study.

Ways of Coping Scale

In order to measure the coping techniques used by the subjects on this study, the Ways of Coping scale (Folkman and Lazarus, 1980) was used. The scale uses general coping items and thus can be used in a wide variety of situations. The Ways of Coping is presented as a self-report checklist; on this study the first scale was filled out in an interview setting to ensure the subjects understood what was required of them. Subjects using self-report checklists may over- report items with which they are struggling; also, they may misinterpret the questions or forget to report on coping techniques which form part of their daily routines. (Cohen, 1987). Subjects may also have formed theories regarding what is being tested and formulate their answers to support or undermine these hypotheses. However, Cohen (1987) writes that self-report measures are at least as predictive of outcomes as other assessments - a view upheld by Folkman and Lazarus (1984) and Shrauger and Osberg (1981, in Kasl and Cooper, 1987).

The Ways of Coping scale measures cognitive and behavioural techniques used in response to a specific stressor. First developed in 1980, it was reviewed in 1986 to a 4-point Likert scale, with the subjects indicating the extent to which they used each of the 72 items. Several studies have shown the scale to have good internal consistency (Folkman and Lazarus, 1980). The scale has been used in different ways by various researchers. In the current study, the coping techniques were divided into six categories: problem-solving, wishful thinking, denial, avoidance, seeking social support and self-blame. These individual categories can be summed into problem focused and emotion focused coping techniques.

General Health Questionnaire

The General Health Questionnaire is a 28-item scale comprising 4 subscales: somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Goldberg and Hillier (1979) analysed the questionnaire and, based on the stability of the data collected over 8 years, found the scale to be stable, with the the first four factors accounting for 59% of the total variance. They point out that the scaled version of the GHQ provides the investigator with more information than is provided by a single severity score. They also note, however, that there is some overlap between the different subscales with the tendency towards a general factor (accounting for 32% of the total variance) being present. They suggest that anxiety is the core phenomenon but that the presence of the other subscales allows the researcher to measure the other dimensions as well.

A general problem with the measurement of coping is that many similarly-named scales, which claim to measure similar constructs, have low correlates with each other (Cohen, 1987, in Kasl and Cooper, 1987). Also, due to the lack of consensus as regards the dimensions measured in the different scales, there is no comparability between the instruments.

It should be noted that no independant measure of physiological health was made by a medical doctor as part of the battery of tests - the reason for this is that there is no agreement amongst medical professionals regarding the signs and symptoms of M.E. and there is thus no medical measure of relapse available - blood tests, muscle biopsies and clinical examinations are consistantly unreliable in diagnosing a relapse of M.E.

The Ways of Coping questionnaire, the General Health questionnaire and an assessment of primary and secondary appraisals made up a three-part battery of tests filled in by the subjects every two months over a nine month period. The subjects' responses to this battery pertained to events which had happened in the two months prior to the date of the test. Ideally, coping techniques could be monitored as they took place, but this was

not possible as the tests were in the form of interviews and were administered to eighty people divided into groups of ten and each subject was seen in person every eight weeks. However, Folkamn and Lazarus (1986) qualify stresses happening in the previous two months as recent.

Statistical Analyses

The data collected from the above procedures was analysed in two ways. Primarily, a Pearon's product moment correlation was used to examine the correlation coefficients in the relationships which were predicted to be significant. Correlation coefficients greater than 0,300 (or less than -0.300) at a probability less than 0.001 were highlighted and those relationships examined more closely. Also, certain variables were expected to correlate well - comment was made on those that were expected to correlate above 0.400 (probability less than 0.001) and did not. Thereafter, a principal components factor analysis with a varimax rotation was carried out on the variables which appeared to be significantly correlated.

It should be noted that a battery of tests refers to the GHQ, the Ways of coping and the measurement of primary appraisals carried out at one time. Statistical investigations compared findings within each battery - e.g. h how certain ways of coping correlated with findings on the GHQ, as well as comparisons between the same individual's different batteries of tests at the four testing times over the nine months. The purpose of the latter investigation was to monitor whether the subjects changed their ways of coping to adapt to new stressors.

Ethical Approval

Ethical approval from the Board of Ethics of the University of the Witwatersrand was obtained prior to the commencement of the study.

RESULTS AND DISCUSSION OF BIOGRAPHICAL QUESTIONNAIRE

In order to reduce errors arising from extraneous variables, the subjects on the study were selected from a population with a confirmed medical diagnosis of M.E. This screening was not infallible, however, and it is possible that certain of the subjects were atypical, even though their blood tests and clinical histories strongly suggested M.E. To further reduce extraneous variables, it was decided to only include one gender. As two-thirds of M.E. sufferers are female, the sample includes women between the ages of eighteen and sixty. The fact that the study consists only of women is significant in terms of the stresses experienced as well as the viruses to which they are exposed. The Nightingale Research Foundation suggests that the higher incidence of women with M.E. may be partially attributed to the fact that women spend more time with small children and are thus exposed to viruses more often. They are also less able to take a break when they get ill - it may be easier for a father to rest when he takes the day off from work than for a mother to spend time recovering when she has a family to look after. However, the majority of women on this study who are mothers have children over twenty years of age. Considering that statistical analyses were only carried out on individuals who had had M.E. for under six years, the minimum age of their children at the time of onset must have been fourteen years. Childhood illnesses are not common at this age, which leaves the possibility that the women did not contract the initial virus from their children, or the virus was dormant for a few years.

In order to make the data more accessible, bar charts and pie diagrams representing some of the results have been compiled; these may be found in appendix 1.

With regard to marital status, 59,8% of the sample were married, 17,1% single and 17,1% divorced (Graph 1). The presence of children is also an important variable; the majority (32,1%) of the women had two children while 27,2% had no children. Of those who had children, 42,4% had children with an average age of over twenty; 20,3% had children in the fifteen to twenty age group and. 20,3% in the ten to fifteen age group. This leaves a combined percentage of 17,0% in the under five and five to ten

group together (Graph 2). The majority of subjects (37,8%) had completed matric, with 34,1% having obtained a university degree (Graph 3). This is a surprisingly high number of women with university degrees, considering that only between two and five percent of the general population obtain a degree. Some researchers (George,1980; Pearlin and Schooler, 1978) found that better education was conducive to adaptive coping - this was attributed to higher levels of cognitive complexity leading to better problem-solving skills and greater intellectual complexity. According to this, the subjects on this study should have fared much better when faced with the same stresses as a lesser educated group - however, as can be seen in the next chapter, the coping techniques used did not appear to be adaptive. The high percentage of women with university degrees on the study may be connected to the above average socio-economic status of the sample, but again the subjects did not comply with theories put forward by other researchers. Meneghan (1983b) suggested that higher socio-economic status is associated with more direct action coping techniques - as will be seen, this was not the case on this study. Only 6,25% of the subjects lived in flats - and these were single women who were unable to work full day, due to their illness, and had nobody to support them. The remainder of the subjects lived in townhouses or houses, mostly in the North, North-west or Eastern suburbs of Johannesburg. Although the subjects were questioned about their own monthly income, this did not give an accurate reflection of their socio-economic status as many did not work and were supported by their husbands.

Outside of their jobs, 43,9% of the women reported doing voluntary work; 19.5% belonged to social clubs and 36,6% belonged to no clubs at all. The high percentage of women who were involved in voluntary work is interesting - many of these women were working for organisations to assist street children or help in hospitals - both of which are prime sources of viral illness. The high incidence voluntary work may not be causally related M.E., however; it may be related to the fact that many of the women on the study were supported by their partners, thus making voluntary work more possible. There may also be a common personality factor underlying both the voluntary work and the M.E. It has been suggested that chronic fatigue will follow any viral illness

if the individual does not take enough time to recover properly. People who are involved in voluntary services may be more enthusiastic and drive themselves harder than others do.

The subjects were questioned regarding both their current employment and their employment before contracting M.E. At the onset of M.E., 51,2% were employed full-time; 18,3% part time and 18,3% were unemployed. At the time of the study, 29,1% were employed full-time, 32,9% part-time and 32,9% were unemployed (Graph 4). Since the onset of the illness, 68,3% had changed jobs and, of those who had changed, 34,6% left their previous employment because of M.E. Of these, only 3,7% left under pressure from their employers. Of those subjects who left their jobs as a direct result of their illness, the majority (56,7%) left three months or more after the illness had begun. 20,0% left within two weeks of the onset and 16,7% left six to twelve weeks after the onset.

In terms of employment, the drop in the number of subjects currently holding full-time jobs as compared to those with full-time jobs at onset is to be expected. In addition to the fatigue and inability to work long hours which accompanies M.E., many of these women may have worked in the early part of their married lives and left work as soon as the family was established. The significant increase of unemployment could also be related to the onset of the illness and serves to highlight the crippling effect that M.E. has on the individual as well as on the society's financial welfare. The finding that the vast majority of women who left their jobs as a result of the illness did so under their own steam may be interpreted in various ways. Firstly, the women may have struggled to keep their levels of performance high enough to avoid dismissal in spite of the illness. This would be in line with the profile of the 'typical' M.E. victim and would help to explain why many of them may have a post-viral fatigue which does not resolve. This hypothesis fits in with the finding that the majority of women who left their jobs did so three months or more after the onset. Three months is a long time to hold a job when suffering from a condition as debilitating as M.E. appears to be. Alternatively, the women could be taking responsibility for their jobs to such an extent that they left be-

cause they felt that they are not performing adequately, even if their superiors had no complaints about their level of competence. Employers may also be sympathetic to the illness and not want to dismiss employees who were obviously ill.

It is possible that the first hypothesis is the most likely, especially when considered in conjunction with the fact that the majority of subjects took no leave from their jobs at the onset of illness. Any viral infection will linger if the immune system does not get a chance to operate - and the profile of the subjects at the time of onset does not suggest that their bodies had much time to recuperate.

At onset, 33,3% were employed in a secretarial or administrative capacity; 16,7% in a medical or allied profession; 12,1% ran their own business or acted as a director; 10,6% were studying and 9,1% were teaching. The remainder worked in sales, marketing or entertainment and film (Graph 5). At the time of the study, 41,8% were employed as secretaries or administrators; 16,4% in their own business; 12,3% in a medical profession; 7,3% teaching and 7,3% studying (Graph 5).

As regards the number of hours worked, at the onset of the M.E. 9,4% worked less than 20 hours per week; 15,6% working 20 - 30 hours per week; 26,6% were working 30 - 40 hours per week; 26,6% working 40 - 50 hours per week and 10,9% working 50 - 60 hours per week. A further 10,9% reported working over 60 hours per week prior to the onset of M.E. (Graph 6). At the time of the study, 32,8% reported working less than 20 hours per week; 12,7% worked 20 - 30 hours per week; 18,2% worked 30 - 40 hours per week; 25,5% worked 40 - 50 hours per week and 11,0% worked more than 50 hours per week.

At the time of onset, 81,3% of the subjects felt that their jobs required them to make decisions and take responsibility; this figure increased marginally to 82,0% when asked with respect to their current positions. At the onset, 57,1% took no rest days at all while 31,2% took under six days leave when they first got ill. 7,8% took more than 15 days leave, often remaining at home for up to two months after a stay in hospital. At

the time of the study, 36,2% still reported taking no sick leave; with 50 taking under six days (31,0% taking one to three days and 19,0% taking three to six days) and 8,6% taking more than 15 days leave per month (Graph 7).

From the above it is concluded that working hours were reported to be very long, with the majority of subjects falling into the normal - to - high category of working hours per week and a few working ridiculously long hours. Despite the illness, a number of the women still worked more hours per week than the maximum recommended by the department of manpower. Even if the figures given were overestimates on the behalf of the subjects, they indicate that the subjects perceived their workload as very severe or that they have the need to portray themselves as very hard workers - both of these explanations hold interesting phychological implications; however, conclusions can not be reached without access to objective records of hours worked. The vast majority of the subjects felt that their jobs required them to make decisions and take responsibility for things - no objective evaluation of this was attempted as it is the individual's perception of responsibility in which the study is interested. Combining these factors with the knowledge that many of these women also had a family and home to look after and a number were studying part time in addition to their jobs at the time of onset, one realises that many of these women were pushing themselves very hard at the time of onset. In addition to work stress, the majority of subjects were undergoing some form of mental or emotional stress in their personal lives at the time of onset.

In terms of economic status and wages earned, 27,5% of the subjects were earning salaries of less than R1000,00 per month at the time of the study; 15,7% between R1000,00 and R1500,00; 9,8% between R1500,00 and R2000,00 and 11,5% between R2000,00 and R2500,00. 11,8% earned between R2500,00 and R3000,00 and 23,7% were earning over R3000,00 per month (Graph 8). The salary distribution at onset was very similar, although the figures were proportionately smaller. Aside from formal employment, 12,7% of the subjects were part-time housewives (they employed maids); 25,6% were full-time housewives and 31,7% reported doing no housework at all. When asked to rate their daily tasks as a source of stress, 18,6% of the subjects rated their current ac-

tivities as an eight on a scale of one to ten (with one being not stressful at all and ten being very stressful). 22,0% rated it at a five and 11,9% gave a two. The remainder of the subjects were evenly distributed over the other options, with 8,5% rating their stress as a ten. When asked to retrospectively rate their activities prior to the onset as a source of stress, 24,3% of the subjects gave a ten. Thus three times as many subjects rated a ten when referring to activities at the time of onset than those referring to current activities. This may be the result of a bias in retrospective reporting, or due to the fact that many of the subjects said that their daily activities were so limited now that they could not be stressful.

As regards the length of illness prior to the commencement of the study, 9,8% had had M.E. for less than one year and 18,3% had had it for one to two years. The majority of subjects (25,6%) contracted M.E. two to three years before the study began; 15,9% contracted it three to four years before the study; 7,3% four to five years and 23,2% had had it for six years (Graph 9). From the first time that they visited their G.P.s about the problem, 28,0% waited less than six months for a diagnosis of M.E.; 20,7% had a six to twelve month delay; 15,8% waited from one to two years; 11,0% from two to three years; 7,4 from three to five years and 17,1% had a delay of over six years from their first visit to a G.P. until a diagnosis of M.E. was reached (Graph 10). Some insight into the frustrating nature of this illness can be gleaned from the fact that more than half the subjects had the clinical symptoms of M.E. for over a year before it was diagnosed; this delay was costly for many of them - financially and emotionally. Many of the subjects commented on the fact that their friends and families did not believe that they were ill at all. Combined with scepticism from the medical profession, some of the subjects began to doubt their own sanity. A few women simply gave up and lived with the symptoms but others went from one doctor to another, having numerous medical tests and running up a large debt to add to their burden.

As regards the cost incurred be the illness, 65,9% of the subjects reported that the costs were not completely covered by medical aid. 66,3% subjects had personally payed over two thousand rands from the onset of the M.E. and 11,3% had payed over one thou-

sand rand. Many of the subjects produced proof of paying hundreds of thousands of rands out of their own pockets, with one exceptional case providing receipts totalling close to a million rand for medical and allied services. (These costs had been incurred over a long period of time and the duration of her illness placed this subject outside of the time parameters set for the study. The subject was visited prior to the onset of the study as she was recommended as an expert by the M.E. Association.) 20,0% reported that the illness had cost them under five hundred rand from the onset, but it should be noted that almost all the subjects who made up this 20% had had M.E. for under one year. These sums must be considered in the light of the increase in unemployment and in women changing from full- to part-time jobs. The amounts spent by some of the subjects were quite alarming - two of the subjects had spent their entire life's savings, selling their houses, and are currently living in very down-[illegible] Hillbrow. Both attribute this change in lifestyle wholly to M.E. In anal[illegible]a[illegible] of time which the subjects waited for a diagnosis and the amount of [illegible] spent in reaching this diagnosis, it should be noted that the subjects who waited the longest (six y[illegible]) were all those who had contracted the illness six years ago. The subjects who contracted M.E. more recently, however, waited a shorter time, proportional to their length of illness. This may be attributed to the increase in publicity about M.E. and the bid to educate medical professionals which has been made by many local and international organisations. The negative results of this increased publicity include a stereotyping of the illness and a tendency for doctors to overdiagnose it more easily.

In terms of perceived social support and activity levels, 43,9% rated their families and close friends as very supportive; 31,7% rated them as moderately supportive and 24,4% felt that they offered very little support. As discussed in the literature review, the notion of social support is a broad one, but overall it has been found to buffer the negative effects of stress (Cobb, 1976; Singer and Davidson, 1987). Also, social support may buffer against feelings of helplessness and thereby increase the efficacy of coping (Brown and Andrews, 1984). In the case of M.E., members of the family may attempt to be helpful by telling the individual that they need to get up an about and that they should try to forget about the illness - in this case the support offered does not meet the needs of the

individual and the support may end up as a further stressor in itself. The level of perceived social support may be used to make certain inferences about the individual. Rosenbaum (1988) postulates that individuals who have a high level of resourcefulness are more likely to help themselves and to solicit help from others, while less resourceful people are more likely to deplete their social reserves by socially dependant behaviour. Thus levels of perceived social support can be used to predict outcome under stressful conditions as well as to suggest the existence of certain personality factors which, in themselves, are not conducive to adaptive coping. Also, there may be personality factors at work in the individual which prevents her from employing the relationship in the time of need. Hansson (1984) finds that people with high self-esteem and low social anxiety find it easier to solicit supportive behaviour from others, while depressed and neurotic people may turn others away - this personality dimension may thus be part of the cause of low perceived social support and independently also part of the cause of high perceived levels of stress.

At the time of the interview, 75,6% of the subjects played no sport at all and 19,5% played non-strenuous sport or had active lifestyles. Prior to the onset of M.E., 8,5% played no sport and 35,4% played non-strenuous sport for less than two hours per week. 25,6% played sport for two to five hours per week; 19,5% for five to seven hours and 11,0% for seven to ten hours per week (Graph 11). These figures show the drop in physical exercise expected with an illness such as M.E..

In the period before contracting M.E., 6,1% of the sample had a relative with a viral illness; 8,5% had an associate with a viral illness; 24,4% had a relative with a non-infectious illness; 4,9% had an associate with a non-infectious illness; 9,8% had a relative with M.E. and 46,3% cannot recall having contact with anybody who was ill at all. In addition to this, approximately half of the subjects who had contact with M.E. had never heard of the illness; the other half had heard or read something about it. Looking at the whole sample, 34,1% had read or heard about M.E. before they contracted it (but had had no physical contact) while 51,2% had never heard about it and were not aware of ever coming into contact with it.

In terms of other illnesses in the subjects' immediate environment in an attempt to clarify the possibility of M.E. being a particular virus, we see that only 15,6% of the subjects recalled any contact with a viral disease - this is not significantly more than the exposure rate of the general population at any one time. In addition to this, 9,8% had a relative with M.E., but it should be noted at more than half of this figure had not had physical contact with this relative before onset. This points the possibility of a genetic component - certainly a genetic vulnerability should be considered and is supported by the fact that 5,4% of the subjects reported that one or both of their children contracted M.E. after the subject herself had fallen ill. Although not included in the statistical analyses, it was noticed, upon meeting two of the families, that the child with M.E. was the one who resembled the mother most in appearance. Although this gives insight into the genetic phenotype rather that genotype, it is something which could be investigated. The hypothesis of genetic vulnerability is further supported by the fact that none of the subjects reported that their husbands had become ill with M.E. - this does not support the theory that it is a contagious virus. These observations could also be explained in terms of the psychological environment in which the children find themselves. If the individual's ways of coping are important in determining the perception of stress, and the level of stress increases the individual's vulnerability to M.E., then children are more likely to learn maladaptive coping skills from their mothers than husbands from their wives, thereby putting them at greater risk.

In the year prior to the onset, 12,2% of the subjects suffered a bereavement; 20,7% suffered another emotional loss (such as a breakup, emigration or any loss not resulting from death); 19,5% were undergoing financial stress; 1,2% were undergoing martial stress; 2,4% had problems in non-family relationships; 6,1% reported major lifestyle changes (such as new babies, renovations and job changes); 18,3% had problems with their jobs and felt that things were not satisfactory in the workplace; 3,7% reported a major illness in their immediate circle of close friends or family; 7,3% had gone through an experience which was considered threatening to themselves (such as a major operation, car accident, assault or robbery) and 8,5% reported no experiences which could be construed as a source of emotional or mental stress (Graph 12). Thus, prior to the

onset the majority of subjects were undergoing some form of emotional or mental stress. The largest numbers had experienced an emotional loss of some sort or were struggling financially. The next largest group had suffered a bereavement and the rest of the subjects were distributed as expected over the other potential sources of stress. A very low percentage were experiencing marital problems - this may have been due to the fact that some of the subjects were not married at that time or that there were other stressors which overshadowed the marital problems in the subjects' minds. It should be remembered that information about the events themselves will not give us insight into the subjective levels of stress experienced by the subjects. This information may only be used as a rough guideline for what to expect from the longitudinal part of the study.

When questioned about the ongoing stresses in their current lives, only 3 of the subjects (3,75%) claimed not to have ongoing stresses; the remainder reported one or more of the following: ongoing financial stresses, martial problems, problems in their immediate families which caused them distress, problematic relationships outside of their family and stress evolving from the workplace

Results of the Coping Analyses

A table has been set out overleaf of all the variables which correlated with eachother with a correlation coefficient greater than 3.000 at a probability of less than 0,01. A discussion of the results is set out after the table, making mention of the correlations which were significant as well as the lack of correlation between variables which were expected to correlate in the light of the literature review.

Key:

Coselbl = coping through self-blame
Corelig = coping through religious conviction
Codeny = coping through denial
Coavoid = coping through avoidance
Coprofo = problem-focused coping
Coemo = emotion-focused coping
Cososup = coping through the use of social support
Ghqanx = anxiety on general health questionnaire
Ghqdep = depression on general health questionnaire
Ghqsods = social disfunction on general health questionnaire
Depress = depression
Confid = confidence
Evrestr = stressful event viewed as restrictive
Evacept = stressful event accepted
Evchange = stressful event regarded as changeable

The last digit signifies the test battery - i.e. test 1, 2, 3 or 4.

Variable	Probab	CorrCoef	Variable	Probab	CorrCoe
depress1 :confid1	0,0001	0,57611	ghqsoma1:2	0,0001	0,44765
ghqanx: confid1	0,0077	0,29939	ghqanx1:2	0,0059	0,32830
depress1: anxious1	0,0005	-0,38531	ghqsods2: ghqsoma1	0,0001	0,44163
ghqanx1: depress1	0,0036	-0,32546	ghqsods2: ghqanx1	0,0082	0,31602
ghqanx1: depress1	0,0056	0,31084	ghqsods2: ghqsods1	0,0004	0,41509
ghqsods1: evacept1	0,0098	0,29072	ghqsods2: ghqdep1	0,0018	0,36892
ghqdep1: evacept1	0,0090	0,29387	ghqdep1: ghqdep2	0,0001	0,66637
depress1: coselbl1	0,0033	0,32908	ghqsods: ghqdep2	0,0051	0,33343
ghqanx1: coselbl1	0,0020	0,34426	ghqanx1: ghqdep2	0,0005	0,41103
ghqdep1: coselbl1	0,0011	0,36294	evtype2:3	0,0078	0,34872
ghqdep1: codeny1	0,0045	0,31869	ghqsoma1:3	0,0020	0,40511

ghqanx1: codeny1	0,0046	0,31751	ghqanx1:3	0,0039	0,37930
coselbl1: depress1	0,0033	0,32908	ghqdep1:3	0,0001	0,54090
coselbl1: ghqanx1	0,0020	0,34426	stakes1:4	0,0018	0,40050
codeny1: ghqanx1	0,0046	0,31751	confid1:4	0,0002	0,47812
ghqsods1: evacept1	0,0098	0,29072	anxious1:4	0,0001	0,56175
ghqdep1: evacept1	0,0090	0,29387	depress1:4	0,0001	0,49692
coselbl1: codeny1	0,0001	0,43451	ghqsoma1:4	0,0001	0,49134
codeny: coavoid	0,0001	0,43451	ghqanx1:4	0,0016	0,40470
coavoid1: corelig1	0,0059	0,30902	ghqsods1:4	0,0001	0,48161
coavoid1: codeny1	0,0001	0,42727	ghqdep1:4	0,0001	0,62875
coselbl1: corelig1	0,0086	0,29555	codeny1:2	0,0025	0,35771
coselbl1: coavoid1	0,0005	0,38428	corelig1:2	0,0001	0,66578
coprofo1: coavoid1	0,0001	0,43233	coavoid1:2	0,0001	0,49566
coprofo1: cososup1	0,0043	0,31972	coselbl1:2	0,0001	0,59376
confid3: depress3	0,0001	0,79709	cososup1:2	0,0002	0,42911
evrestr3: depress3	0,0001	-0,49190	coprofo1:2	0,0001	0,60916
mastery3: depress3	0,0026	-0,39121	corelig1:3	0,0001	0,58834
mastery3: anxious3	0,0001	0,60494	coavoid1:3	0,0060	0,35982
mastery3: confid3	0,0030	-0,38659	coselbl1:3	0,0001	0,74134
corelig3: stakes3	0,0039	0,37630	cososup1:3	0,0062	0,35806
coselbl3: ghqdep3	0,0002	0,47432	coprofo1:3	0,0001	0,58436

corelig1:4	0,0001	0,67767	confid3: mastery3	0,0030	-0,38659
coselbl4:1	0,0001	0,72716	anxious3: coprofo3	0,0008	0,43119
coprofo1:4	0,0002	0,47631	anxius3: mastery3	0,0001	0,60494
depress2:3	0,0010	0,42491	evrestr3: depress3	0,0001	-0,49190
ghqsoma2:3	0,0004	0,45694	depress3: mastery3	0,0026	-0,39121
ghqanx2:3	0,0092	0,34493	coselbl3: ghqsods3	0,0030	0,38933
ghqdep2:3	0,0001	0,60471	coselbl3: ghqdep3	0,0002	0,47432
resolve2:4	0,0001	0,51489	coprofo3: evchange3	0,0005	-0,44483
ghqsoma2:4	0,0001	0,48782	evtype4: anxious4	0,0043	0,37245
ghqanx2:4	0,0001	0,49406	depress4: confid4	0,0001	0,61619
ghqsods2:4	0,0011	0,42147	anxious4: confid4	0,0001	-0,51205
ghqdep2:4	0,0001	0,63794	anxious4: depress4	0,0011	-0,42002
codeny1:2	0,0025	0,35771	evchange4: ghqanx4	0,0001	0,53203
codeny2:3	0,0010	0,42604	evchange4: ghqsods4	0,0001	0,55519
corelig2:3	0,0001	0,59746	evchange4: ghqdep4	0,0019	0,03981
coavoid2:3	0,0023	0,39566	evtype4: mastery4	0,0003	0,45834
coselbl2:3	0,0001	0,54924	confid4: mastery4	0,0020	0,40069
cososup2:3	0,0001	0,49507	anxious4: mastery4	0,0001	0,73609
coprofo2:3	0,0001	0,57539	depress4: mastery4	0,0001	-0,49805
codeny2:4	0,0050	0,36723	coselbl4: confid4	0,0002	0,47390
corelig2:4	0,0001	0,75138	coselbl4: depress4	0,0073	0,35191

coavoid2:4	0,0035	0,38013	coselbl4: ghqdep4	0,0001	0,48407
coselbl2:4	0,0001	0,65040	evchange4: ghqsods4	0,0001	0,55519
cososup2:4	0,0003	0,45766	evchange4: ghqdep4	0,0019	0,39891
coprofo2:4	0,0040	0,37533	coselbl4: ghqdep4	0,0001	0,48407
evtype1:3	0,0078	0,34872	confid2: anxius2	0,0038	-0,34400
ghqsoma1:3	0,0020	0,40511	depress2: anxius2	0,0003	-0,42583
ghqanx1:3	0,0039	0,37930	depress2: confid2	0,0001	0,59569
ghqdep1:3	0,0001	0,54090	evchange2: resolve2	0,0001	0,45971
ghqsoma3:4	0,0001	0,59039	evchange2: relev2	0,0013	0,38058
ghqanx3:4	0,0003	0,47078	evrestr2: depress2	0,0078	-0,31760
ghqsods3:4	0,0012	0,42066	coselbl2: depress2	0,0080	0,31697
ghqdep3:4	0,0001	0,70341	confid2: mastery2	0,0001	-0,50398
confid3: coselbl3	0,0085	0,34517	depress2: mastery2	0,0001	-0,59216
anxious2: mastery2	0,0001	0,64401	coselbl3: ghqanx3	0,0053	0,36774
evknow2: cososup2	0,0001	-0,46814	coselbl3: confid3	0.0085	0,34517
coselbl2: evrestr2	0,0067	-0,32344	corelig3: stakes3	0,0039	0,37630
coselbl2: evrestr2	0,0017	-0,37138			
coprofo2: codeny2	0,0041	0,34107			
coselbl2: corelig2	0,0052	0,33312			
coprofo2: corelig2	0,0006	0,40477			
coselbl3: ghqsods3	0,0030	0,38933			

Discussion of results supporting or negating the hypotheses made will be set out in the same order as the hypotheses themselves.

1. Denial is expected to be positively correlated to poor general health, while problem-focused coping (associated with higher learned resourcefulness) should have a low or negative correlation with poor general health.

No consistent significant correlation was found between the use of denial and the reporting of poor health over the nine month period. However, denial was positively correlated with anxiety in the GHQ in the first test session (Correlation coefficient 0,31869; probability 0,0045). No relationship was found in the other three test sessions. In the first test session, depression on the GHQ was correlated with self blame as a coping mechanism (correlation coefficient 0,36294; probability 0,0011) and with denial as a coping mechanism (correlation coefficient 0,31869; probability 0,0045). This is as expected in the light of the literature on the psychological and physiological effects of denial and self-blame. Self blame was also correlated with depression in the second test session (correlation coefficient 0,31760; probability 0,0080). In the third test session self blame was correlated with depression (correlation coefficient 0,47432; probability 0,0002); with anxiety (correlation coefficient 0,36774; probability 0,0053) and with social dysfunction on the GHQ (correlation coefficient 0,38933; probability 0,0030). In the fourth session self blame was correlated with depression on the GHQ (correlation coefficient 0,48407; probability 0,0001).

2. A positive relationship is expected between poor general health and harm - loss primary appraisal.

There was no significant correlation between harm - loss as a primary appraisal and poor general health.

3. A positive correlation is anticipated between feelings of hopelessness and helplessness and poor general health and

4. Lack of control over the situation in which the individual finds herself should be positively correlated with poor general health and

5. Attempts to control uncontrollable events should be positively correlated with health complaints.

In order to assess the relationship between poor health and feelings of hopelessness and helplessness and lack of control over the situation, the correlation between GHQ scores and reports of mastery, perceived ability to change the event (as part of the primary appraisal) and confidence was investigated. Again, isolated correlations occurred but overall the pattern did not indicate a significant relationship. In the first test session, depression on the GHQ was positively related to the primary appraisal technique of feeling that the event was one to be accepted and gotten used to, rather than changed (correlation coefficient 0.29387, probability 0.0090). However, in the fourth test session, anxiety (correlation coefficient 0,53203, probability 0,0001), depression (correlation coefficient 0.39810, probability 0,0019) and social dysfunction (correlation coefficient 0.55519, probability 0.0001) on the GHQ were positively related to the perception that the stressing event was one that could be changed by the subject. These two findings are contradictory and no other findings were found which could clarify the relationship. In the third test session, mastery was correlated with anxiety (correlation coefficient 0.60494; probability 0,001, but mastery was also negatively correlated with depression (correlation coefficient -0,39121; probability 0,0026). In the fourth test session mastery was correlated with confidence (correlation coefficient 0,40069; probability 0,002) but mastery was also correlated with anxiety (correlation coefficient 0.73609; probability 0,0001) and negatively correlated with depression (correlation coefficient -0,49805; probability 0.0001).

6. Low levels of self focus are expected to correlate positively with poor health.

This relationship was not supported by the data.

7. The negative effects of the situation on the individual's state of health should be ameliorated by the presence of a good personal relationships and a positive perception of social support.

Use of social support as a coping technique was correlated with the use of problem-focused coping (correlation coefficient 0.31972; probability 0.0043) in the first test session but in the second session the use of social support was correlated with self-blame (correlation coefficient 0.45940; probability 0.0001). No relationship was found between the use of social support and the subject's health as rated by the GHQ.

8. The subjects will adapt their coping style to the situations in which they find themselves and

9. As the stressful situations that the subjects report will vary over the 9 month period, a consistent pattern of coping mechanisms should not be set up. Therefore, no correlation should be found between the ways of coping used at the different times of the test if there is no correlation between the types of situation in which the subject finds herself.

From the Pearson Product Moment Correlation, a constant pattern of coping behaviour emerged without there being a pattern in the types of situations which were emerging. In order to investigate this relationship between the different types of coping used throughout the nine months more fully, a factor analysis was carried out on the different coping styles and also on the different events reported over the period of the study. Interestingly, no relationship was found between the types of event, while a significant stability was found in the types of coping used. The results of the Principal Components factor analysis with a varimax rotation are tabulated in appendix 2. In summary, the factor analysis of problem-focused coping yielded one factor explaining 2,689292 of the variance; emotion-focused retained one factor explaining 2,891016 of the variance, using social support as a coping technique retained a factor of one explaining 2,322033 of the variance and coping through denial retained one factor explaining 1.977074 of the variance.

10. The primary and secondary appraisals should be situation specific and should correlate positively with each other.

Primary and secondary appraisals were not situation specific and subjects perceived the event as not controllable 67% of the time although there were a wide variety of stressing events described. Also, 78,3% of the events described were perceived as threatening or potentially harm-loss while only 21,7% of the events were seen as a challenge.

11. In terms of the coping mechanisms used, acceptance of the event as uncontrollable in the process of primary appraisal should be positively correlated with the use of emotion-focused coping, while the perception of the event as controllable should correlate positively with the use of problem-focused coping.

No correlation between perception of the event as controllable and the use of problem-focused coping, nor between controllable events and emotion-focused coping was found. However, it should be noted that the majority of the events (69,3%) were perceived as uncontrollable by the subjects and that, throughout the study, subjects used emotion- focused coping far more than problem-focused coping, despite the variety of stressors with which the individuals were faced.

Thus few of the hypotheses based on the literature review were supported by the data from the Pearson product moment correlation. Individual sessions showed some correlation but these correlations were not consistently significant throughout the four tests. The significance of the results thus lies in the finding that many of the techniques used are not in line with conventional theories of adaptive coping.

DISCUSSION

From the literature review, it can be seen that a higher level of perceived stress leads to decreased efficacy of the immune system and increased behaviours leading to pathology. Maladaptive appraisals and coping will increase perceived levels of stress, thus decreasing

the efficiency of the immune response and increasing the chance of the subject contracting a virus or falling prey to one of the stress-related diseases. Proposed relationships and hypotheses drawn from the literature review were not supported. There are three possible explanations for this lack of relationship. The first (and most unlikely) is that research supporting these relationships in the literature review is incorrect. However, due to consistent reporting throughout the research and the reputable methods used, this hypothesis has not been pursued. Alternatively, the internal validity of the current study could have been compromised by the subjects not reporting their appraisals and physiological symptomatology accurately. This hypothesis has also been discarded here due to the careful use of the interview technique, ensuring that the subjects understood what was required of them, and the cooperation experienced throughout the study. The third, and most likely option, is that the subjects on this study do not deal with stressors in the same way that other individuals do. This hypothesis is supported by the stability in appraisal and coping behaviours across the nine month period, despite the fact that there was no stability in the types of situations arising. As postulated by Averill, O'Brien and de Witt (1977), rigid behaviour patterns, regardless of whether they are appropriate or not, appears to be maladaptive.

This deviation from the coping 'norm' supports the central hypothesis of this study - that maladaptive coping mechanisms are associated with the relapse of physiological illness. The exact nature of this relationship is not clearly defined, but it can be seen, from the biographical details, that the majority of the subjects experienced a variety of stresses during the year prior to the onset of the illness and the nine month period of the study. If the lack of coping techniques was present before the onset of the illness, it is clear that this disadvantage would make the individual more vulnerable to contracting and illness like ME and less likely to recover rapidly.

There is the possibility that maladaptive coping mechanisms are not causally related to the illness. The debilitating nature of ME could reduce the subject's coping repertoire drastically. Certainly it would explain a decrease in the use of problem-focused coping and reduce the individual's perceptions of mastery. As it is practically impossible for

ME sufferers to engage in any form of active behaviour - be it physical or mental - it is not surprising that they do not report the use of problem-focused coping. In fact, this lethargy may also explain the lack of consistently reported emotion-focused coping such as denial and thereby explaining the lack of a clear relationship between denial and physiological pathology. It must be realised that denial takes as much, if not more, emotional energy than problem-focused coping.

Perhaps the most interesting finding is that the stressful situations in which the individual found herself over the nine months did not determine primary and secondary appraisal; nor did it seem to be related to the type of coping in which the subjects were engaging. These findings do not support the findings of researchers cited in the literature review, in particular those of Folkman and Lazarus (1988) who hold that primary and secondary appraisal should be situation specific and thus should change as situations change. Also, the individual should only be stressed if the primary appraisal is one of threat or challenge or harm/loss. However, most of the primary appraisals reported by the subjects on this study were those of threat or harm/loss; there were very few subjects who appraised their situations as challenging. The high number of threat or harm/loss primary appraisals do not necessarily show that M.E. sufferers see events as more threatening than other people do; in the interview the subjects were asked to answer the questions with reference to a particular stressor which had occurred during the previous 2 months. Thus, by the nature of the fact that that event was stressful to them, the primary appraisal is likely to be threat or harm-loss. All the events that were assessed as benign-positive would not have featured in the interview. However, it is interesting that the subjects rated most events as threatening or potentially loss-inducing rather than challenging - the third type of primary appraisal that may lead to a stress response. As noted in the results section, no significant relationship was found between harm-loss as a primary appraisal and decreased levels of general health - this finding could be partly attributed to the finding that most of the primary appraisals were threat or harm-loss and so not enough challenge primary appraisals were recorded for a significant comparison to take place.

The above finding ties in with the subjects' secondary appraisals of the event - here the event is seen as essentially controllable or uncontrollable (Folkman and Lazarus,1988) and the individual decides what can be done about the situation. A sense of control may act as a buffer by enhancing self-esteem and allowing the individual to become more action-oriented and, if the problem in controllable, lead to mastery of the situation, eradication of the stressor and a positive learning experience. It must, however, be noted that notions of control are difficult to define and there is an ongoing controversy about how much control the individual actually has over any situation and to what extent we are all controlled by numerous unconscious and external forces.

However, the causal direction of the relationship between having M.E. and seeing events around one as uncontrollable is not established. This type of secondary appraisal may be a result of the onset of M.E. which renders the individual unable to do much - emotionally or physically - to control the situation. On the other hand, a lowered sense of control and cognitive mastery is a negative spiral into which the individual may fall and this may influence the onset of disease. Cognitive mastery and positive association may be linked to a decreased physiological response to stressors via neurological centres in the hippocampus (Cox, 1988). Also, Dohrenwend and Martin (1978) find that events that are the result of deliberate decision-making are less stressful. Engel (1968) and Jensen (1987), cited in the literature review, strongly support the relationship between hopelessness and helplessness and the onset of disease.

Mastery and feelings of confidence were positively correlated with anxiety and negatively correlated with depression. This may be due to a sense of control leading to a sense of responsibility, and thus being associated with anxiety. The negative correlation with depression is as expected in the light of the literature review.

Gilbert's theory of learned helplessness (1988) highlights how individuals can become caught up in this negative spiral by searching for solutions or escape plans; if the search is non-productive and the stressor remains constant, the individual enters an inhibited state with a decrease in action-focused cognitions. It is possible that attempts to deal

with an illness, which cannot be ameliorated via action-focused coping, may have facilitated the move towards learned helplessness. Thus the subjects' use of emotion-focused coping, even when problem-focused coping would be more effective, may be an extension of the move to emotion-focused coping at the onset of the illness. Even though the study indicates that the subjects' coping techniques are not adaptive, these techniques may ironically have been encouraged by the onset of M.E. In fact, many researches of M.E. (Macintyre, 1988; Shepherd, 1988) postulate that the only way to recover from M.E. is to stop the ongoing struggle with the disease and attempts to 'get over it' via action-oriented behaviour, as these sorts of coping attempts merely exacerbate the fatigue.

Throughout the nine month period, the subjects predominantly used emotion-focused coping; this is to be expected in cases where the stressor was primarily to do with health or related issues (i.e. issues where active problem-solving is unlikely to be useful). However, many of the stresses reported by the subjects were related to their employment, where problem-focused coping would be more appropriate.

Folkman and Lazarus (1984) postulate that coping is an attempt to bridge the gap between perceived capacity and demand. This can be done by direct action or palliative modes and either of these can be used to reduce demand or increase capacity. It would appear that M.E. sufferers do not use direct action much at all and their palliative coping techniques are inconsistently used. Also, palliative or emotion-focused coping is only really useful in the short term or if the event is truly beyond the individual's control (Lazarus, 1983) - this may help to explain why the predominant use of emotion-focused coping by the subjects does not appear adaptive and does not improve their general health nor state of mind (as measured on the GHQ). As regards social support, without the ability to confide in others, the individual may have difficulty cognitively organising the event and the presence of an intimate relationship is important in predicting the occurrence of depression in women (Brown and Harris, 1988). The majority of the women on this study did not feel emotionally supported - by their families, friends and the medical profession - this factor may influence the individual's ongoing coping and

perception of the world around them and may contribute to the onset of, or delayed recovery from, illnesses such as M.E.

The relationship between self-blame and anxiety and depression may be understood in terms of the subject turning feelings of anger and guilt inwards rather than directing them outwards at external causes. This also influences the perception of self, leading to feelings of worthlessness; it also leads to guilt which makes it harder to call on social support. All of these factors will decrease coping resources available.

Predicted areas of stress proved to be correct with most of the subjects reporting financial and marital stressors, as well as problems with their children and bereavement. Eighty subjects answering four questionnaires each over nine months amounts to 240 questionnaires - of these, only one questionnaire was 'spoiled' by the subject responding that she had not experienced any major stressors over the previous 2 months. The high levels of stress experienced by the subjects may be a reflection of the South African political and economic situation; however, the presence of an illness and other stressors may lead to attentional deficits (Reason, 1988) which may contribute to the increased number of accidents and other stressful events in the subjects' lives. Bereavement and loss featured strongly in the lists of stressors experienced and must be added to the losses resulting from an illness such as M.E. Bereavement was also an important and frequent event preceding the onset of M.E. and the physiological symptoms of depression following loss must be differentiated from a diagnosis of M.E. (Bartrop, 1977 and Parkes,1970). Bereavement results in the loss of a love object as well as a loss of support and positive reinforcement - all of these factors will influence the individual's ability to cope with stressful situations. Should the individual be exposed to disease at this time, the likelihood of contracting the disease appears to be increased. Also it must be noted that many of the stresses experienced by the subjects were cumulative, such as ongoing problems in relationships which were not resolved at all over the nine month period of the study. Appley (1987) theorised that this sort of stress was more debilitating than cyclical stress with intermittent recovery intervals. Also these cumulative stressors are superimposed on the chronic stress of having M.E.

As regards Mandler's (1982) theory that stress is experienced when events interrupt the sequence of habitual actions or thoughts, thereby activating the autonomic nervous system and a state of arousal, it could be postulated that the onset of an illness such as M.E. could be just such an interruption, thereby driving the individual into a state of arousal. This would have direct effects on the physiological and psychological state of the individual as well as increase vulnerability to other stressors.

It should be recalled that stress in itself can cause many of the symptoms of M.E. (Appley and Trumbull, 1977) including fatigue, muscle pain and gastrointestinal disorders. Although this study does not postulate that the syndrome reported by M.E. sufferers is purely stress-related, it is possible that these physiological reactions to stress are superimposed on the symptoms of an existing viral illness, thereby amplifying them. This would be in addition to the effects of stress on the immunological, behavioural and hormonal functioning of the individual.

As previously noted, the purpose of this study was not to gather information about life stresses or childhood events, but many of the subjects volunteered information about their childhoods. This information was not included in the statistical analyses but merits mention as a consistent pattern emerged. Predominantly, early experiences were reported as being negative, with perceptions of the parents as overbearing and non-supportive of the child. Eight subjects spontaneously volunteered information concerning alcohol abuse by one or both of their parents. However, for this sort of information to be useful, a study would have to designed specifically to monitor the individual's perception of her childhood and a baseline matched control would have to be used in order to compare the M.E. sufferer's perceptions to those of non-M.E. sufferers.

In summary, it is possible that individuals who develop an illness such as M.E. are predisposed to the stress response by primary and secondary appraisals based on perceptions of helplessness and lack of control. Thus they may experience higher levels of stress that other people in similar environments - and, via the neuroendocrine,

behavioural and immunological axes previously discussed, be more vulnerable to viral infections. A negative spiral may be set up, with failure to cope becoming a stressor in itself and further damaging self-esteem.

FUTURE RESEARCH

The major limitation of the findings obtained in this study is that the nature and direction of the causal relationship could not be established. Future research could remedy this by looking at a population which is free of illness and comprehensively assessing coping techniques. This sample would then be used in a long-term follow-up, assessing which of the patients contracted certain illnesses. In other words, a cohort study would be very useful.

Another area of possible future research would be to investigate more fully the lifestyles of people who have contracted M.E. Interestingly, seventy six of the eighty subjects (95%) had dogs as pets - either at the time of the interview or until a period shortly before. Further, most of the dogs were small and fluffy (like maltese poodles) and lived in very close contact with the subjects. Attempts to establish a statistical percentage of the South African population with small fluffy dogs were unsuccessful; the high percentage is suggestive of a relationship, but once again the causal nature of the relationship is unclear. There may be some sort of virus which is passed reciprocally between the dog and the owner, but enquiry into this did not prove fruitful aside from some Veterinarians referring to a canine disease with very similar symptoms to those of M.E. However, this disease predominated in mid- European forest land and no connection is immediately apparent. The other possibility is that there is a personality factor common to most M.E. sufferers - this factor may include love of animals or the need for small pets close at hand as company or comfort. This need may have developed as a result of the isolating effect of a chronic illness, although most of the subjects had their dogs at the time of onset.

Mitchell et al (1983) emphasise the importance of family stress in the onset of illness and a study on the stresses within the families of M.E. sufferers could cast some light onto this important dimension. Also research into the physiological response to stress - such as cortisol or growth hormone levels - may highlight any differences between M.E. sufferers' response to stress and that of the general population.

Kaplan (1980) postulates that many coping techniques are adopted so as to retain our sense of self esteem. Cohort studies looking at levels of self esteem in a group and then following the group for a number of years in order to see which subjects develop M.E. would provide interesting insight into levels of self esteem. Low levels of self-esteem may also correlate with the use of emotion-focused, rather than problem-focused, coping techniques.

In terms of the findings of this study, future research could further investigate the relationship between locus of control and sense of personal mastery and the outcome of a stressful event. Again, this sort of investigation would be more useful if carried out as a cohort study and individual's coping behaviours were studied before the onset of an illness. Further studies of this nature could cast some light onto the causal relationship between the rigid pattern of coping noted in this study and the onset of disease, and also confirm (or disconfirm) the use of certain primary and secondary appraisals and emotion-focused coping in people with chronic diseases.

An intervention study could be set up in order to monitor the effect of stress-inoculation programmes such as that of Rosenbaum (1988) on individuals with M.E. - if the maladaptive coping techniques found by this study are playing a causative role in the progression of the disease, an increase in their levels of learned resourcefulness may correlate with an improvement in their general health.

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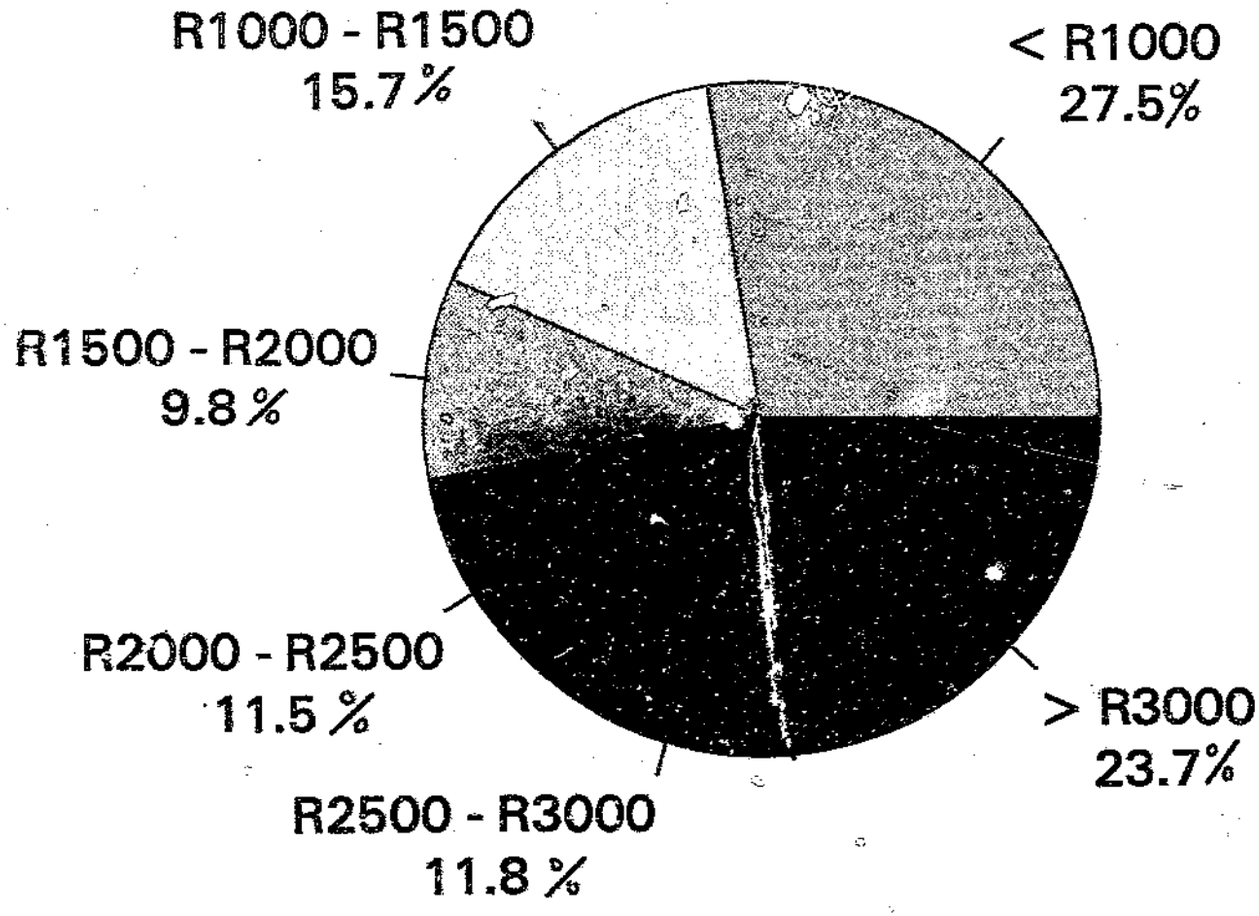
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Graph 8

Wages earned at onset



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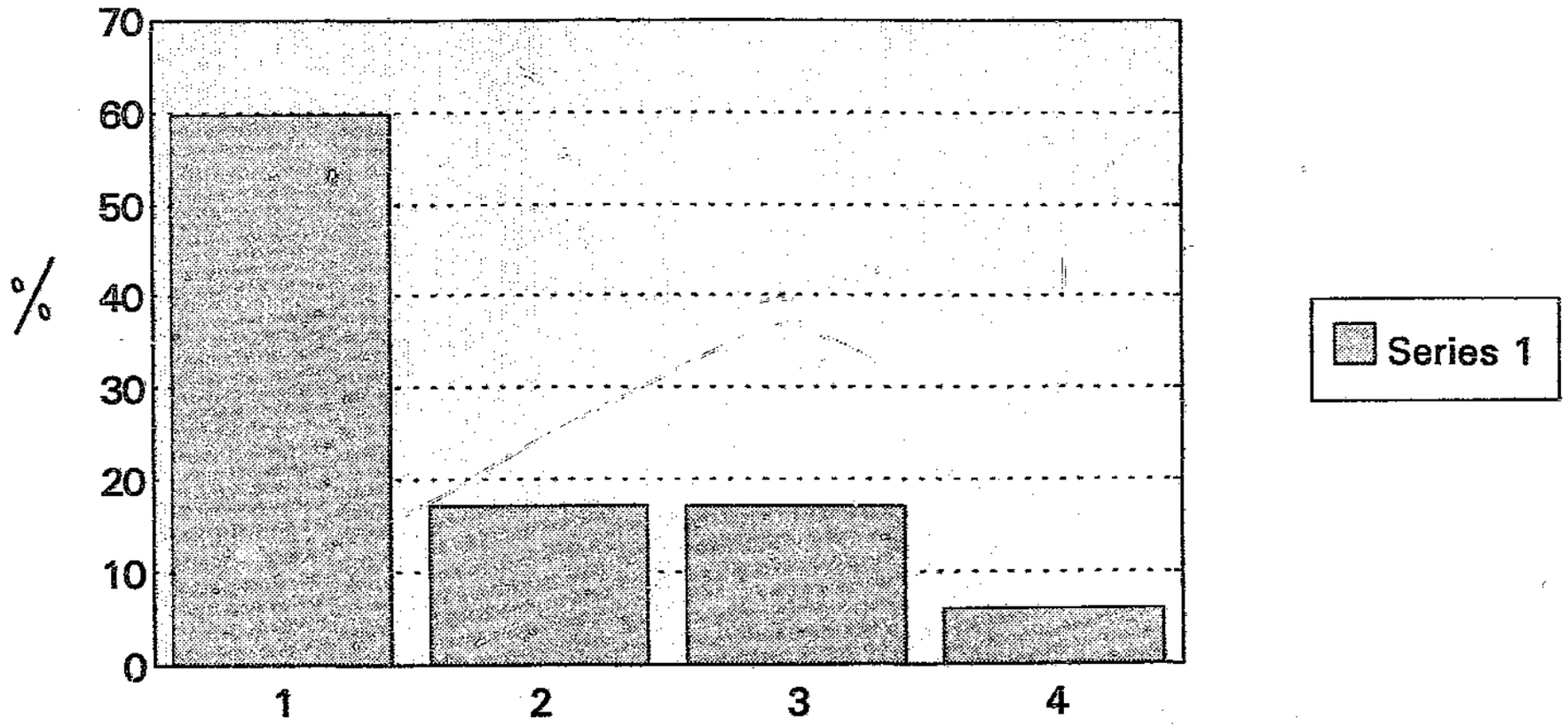
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Graph 1

Marital status

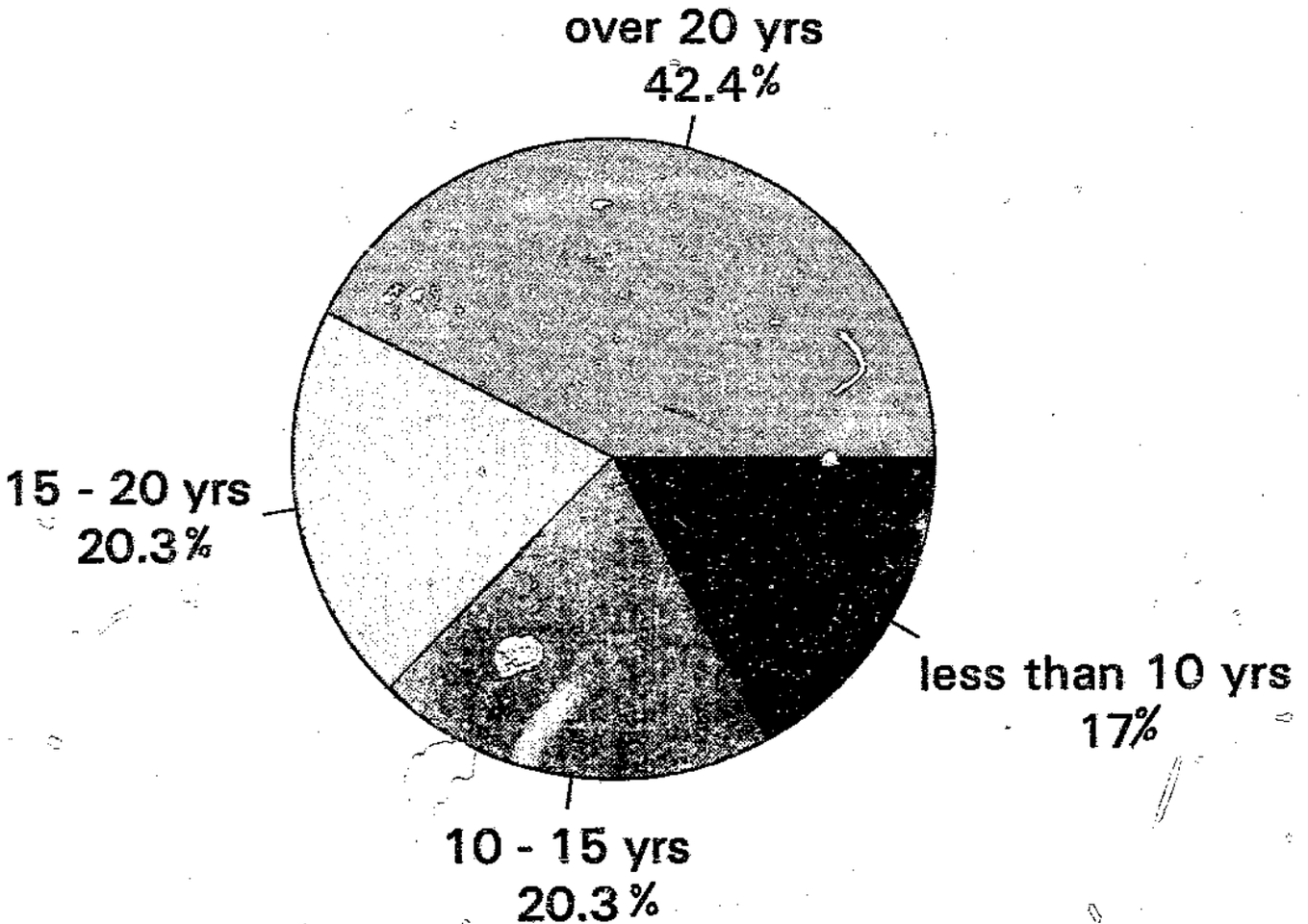


1 = married; 2 = divorced; 3 = single; 4 = widowed

APPENDIX 1

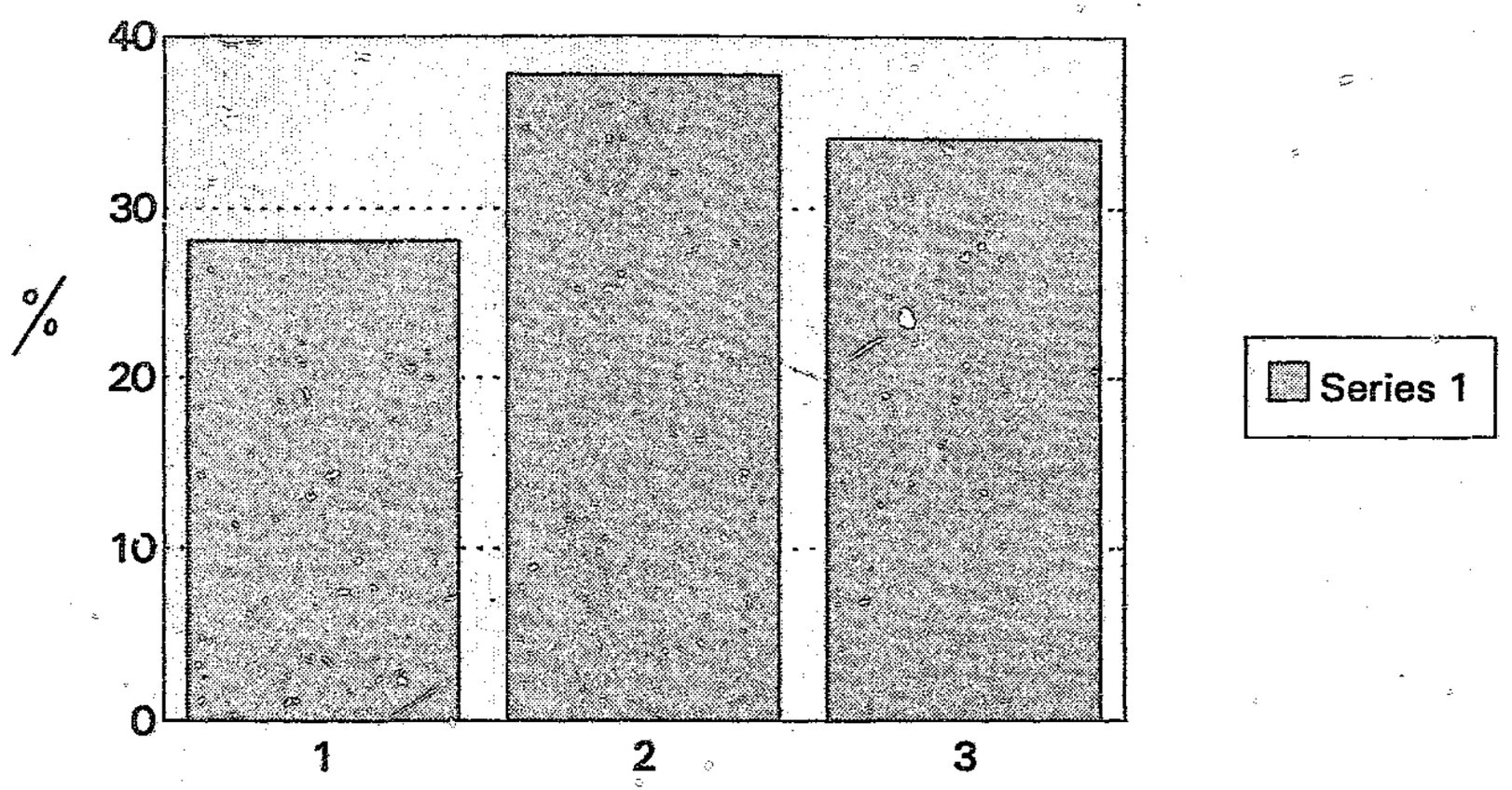
Graph 2

Children's ages



Graph 3

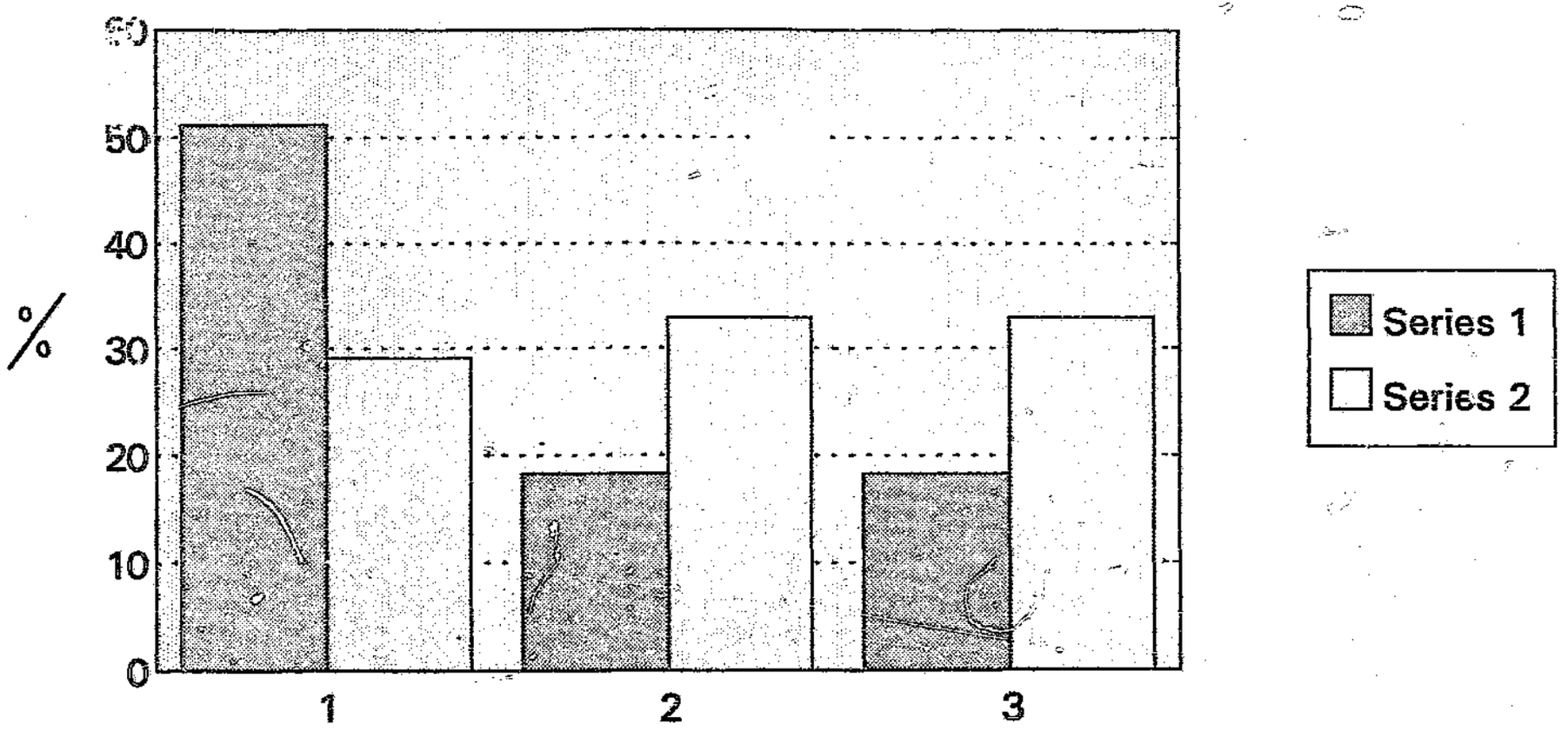
Educational Status



1 = Std 8; 2 = Matric; 3 = University Degree.

Graph 4

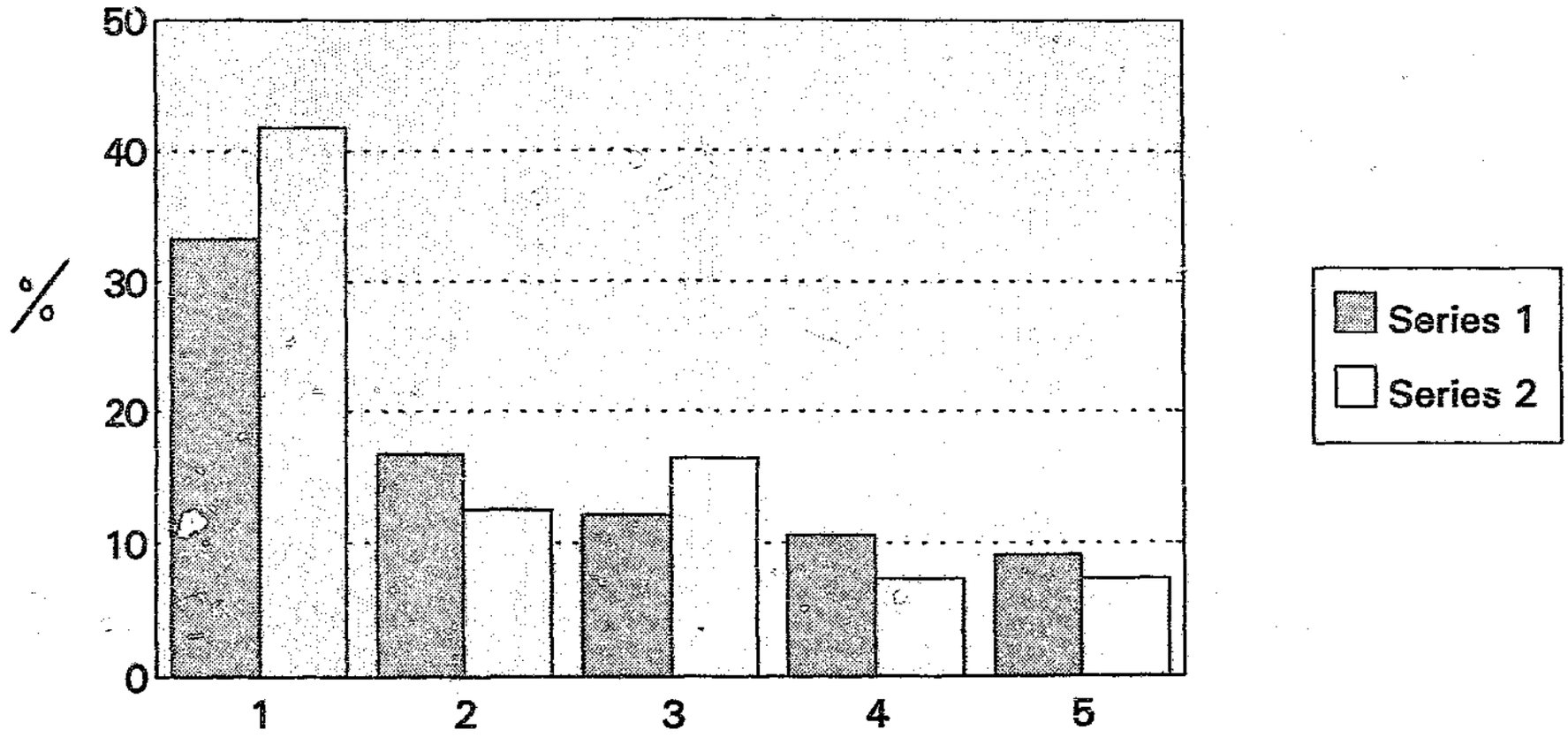
Employment



1 = full-time; 2 = part-time; 3 = unemployed. Series 1 = onset; series 2 = current.

Graph 5

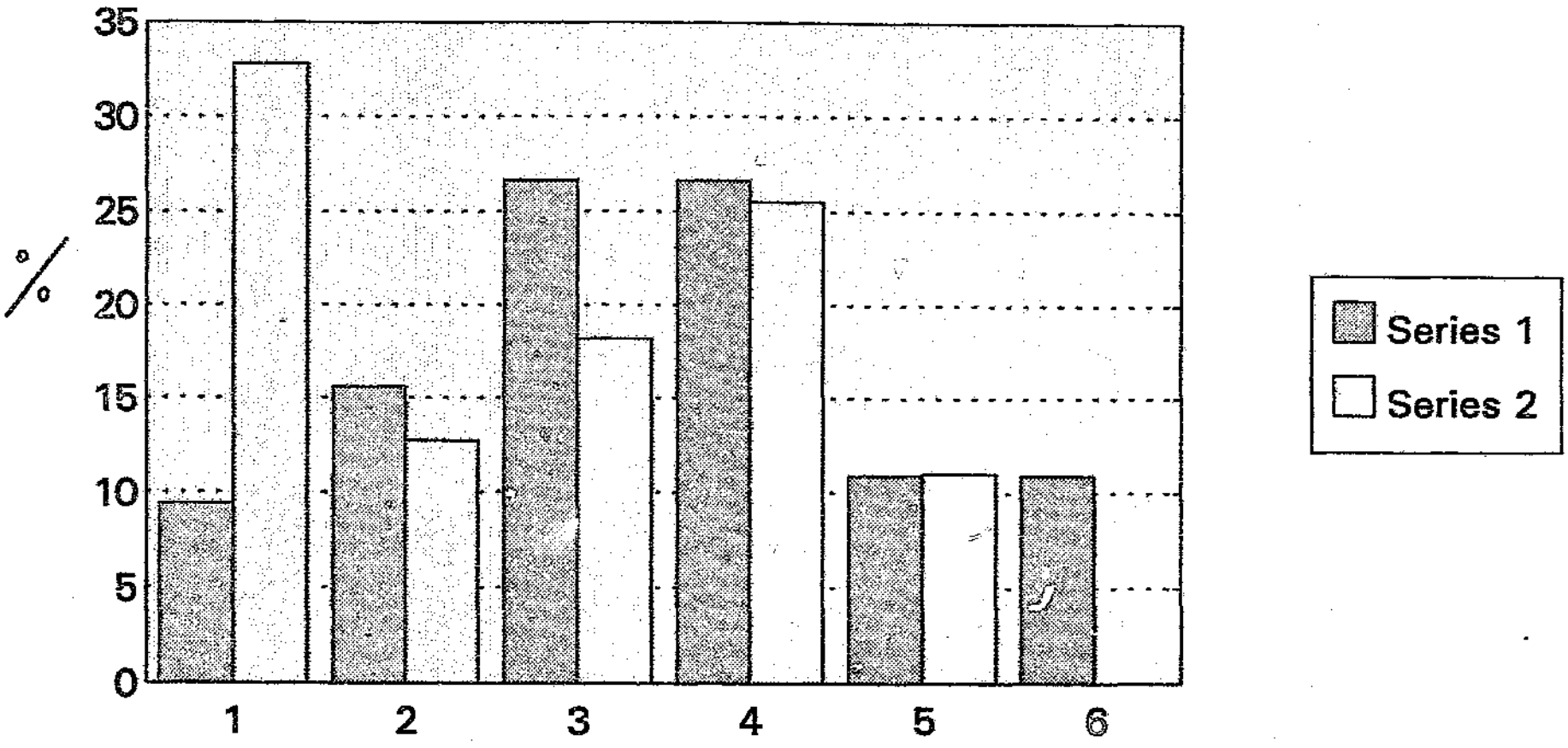
Occupation



1 = administrative; 2 = medical; 3 = director; 4 = student; 5 = teacher. Series 1 = onset; series 2 = current

Graph 6

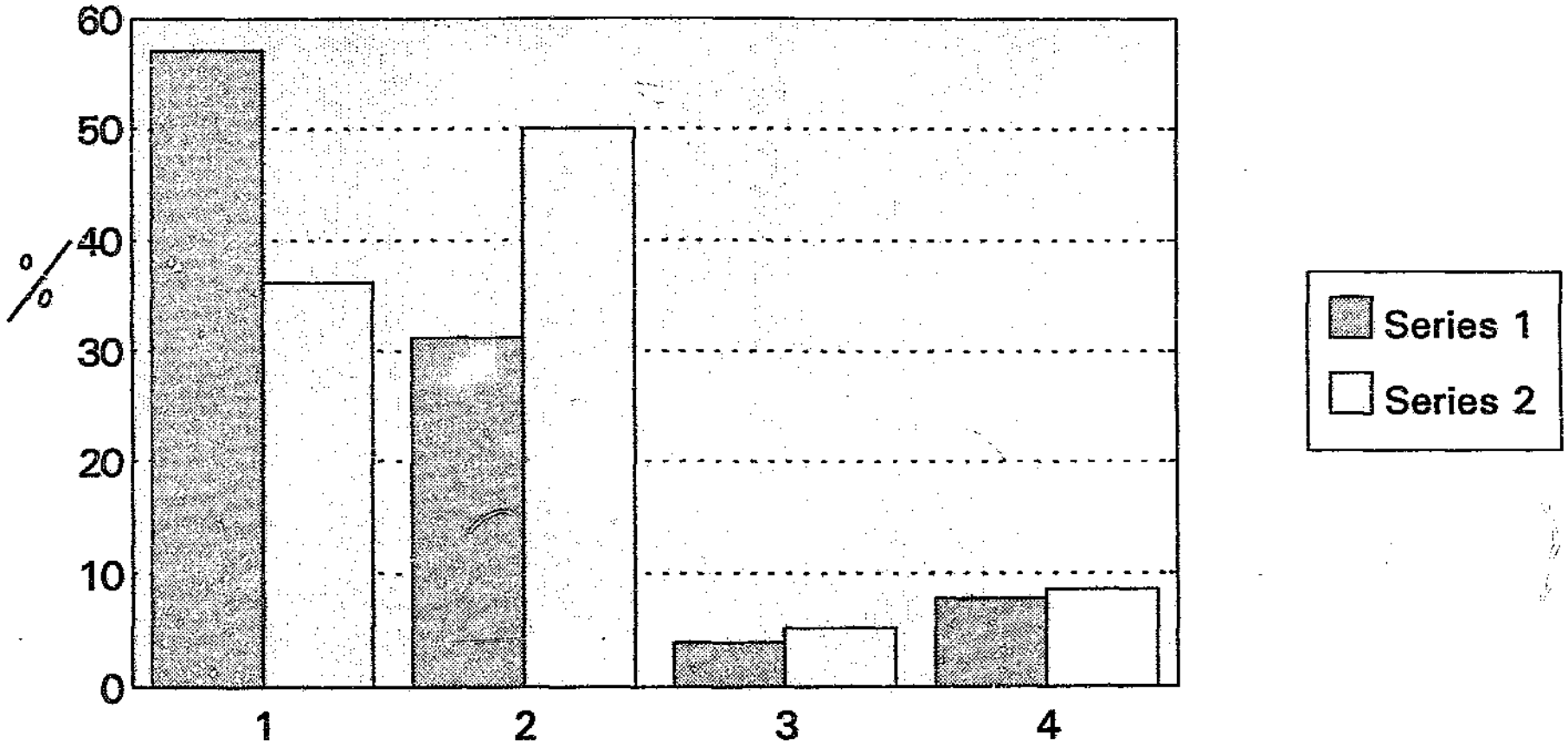
Hours worked per week



1 = <20; 2 = 20-30; 3 = 30-40; 4 = 40-50; 5 = 50-60; 6 = > 60. Series 1 = onset; series 2 = current

graph 7

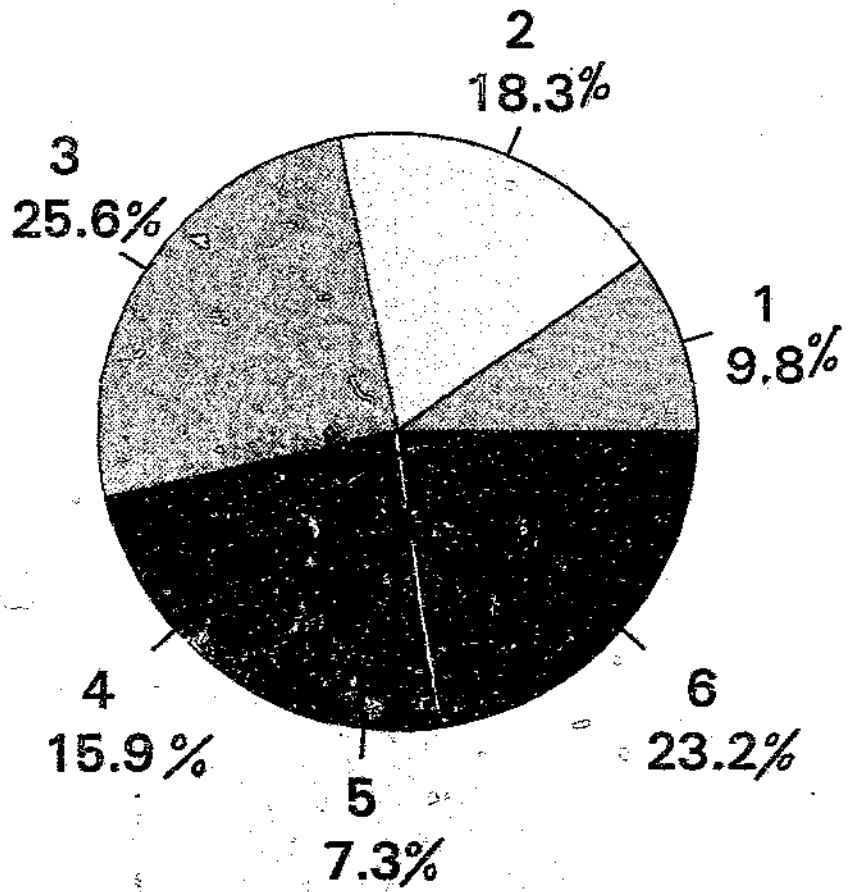
Number of sick days per month



1 = none; 2 = 1-6 days; 3 = 6-15 days; 4 = >15 days. Series 1 = onset; series 2 = current

Graph 9

Period of illness

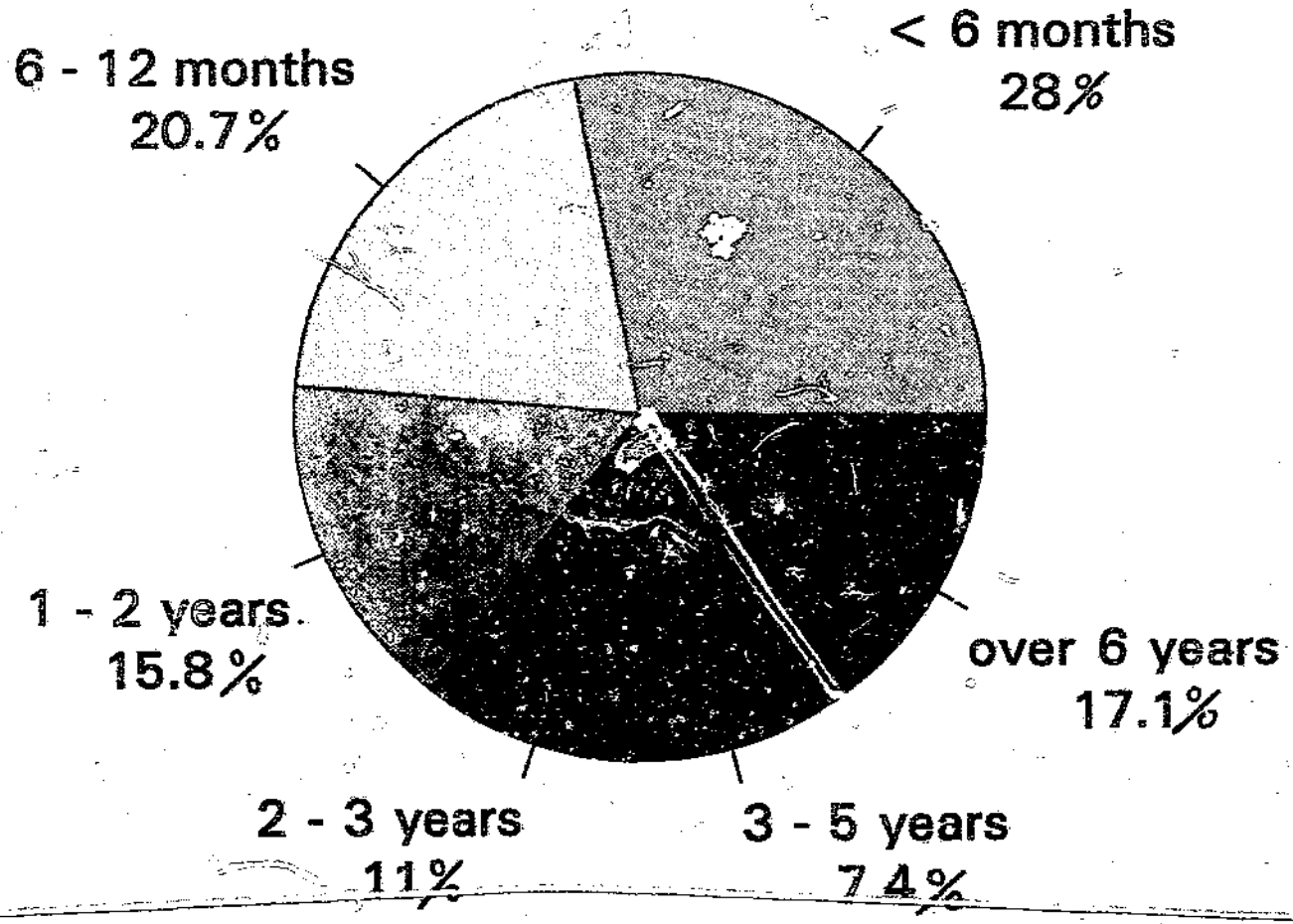


Series 1

1 = < 1yr; 2 = 1-2yrs; 3 = 2-3yrs; 4 = 3-4yrs; 5 = 4-5yrs; 6 = 5-6yrs.

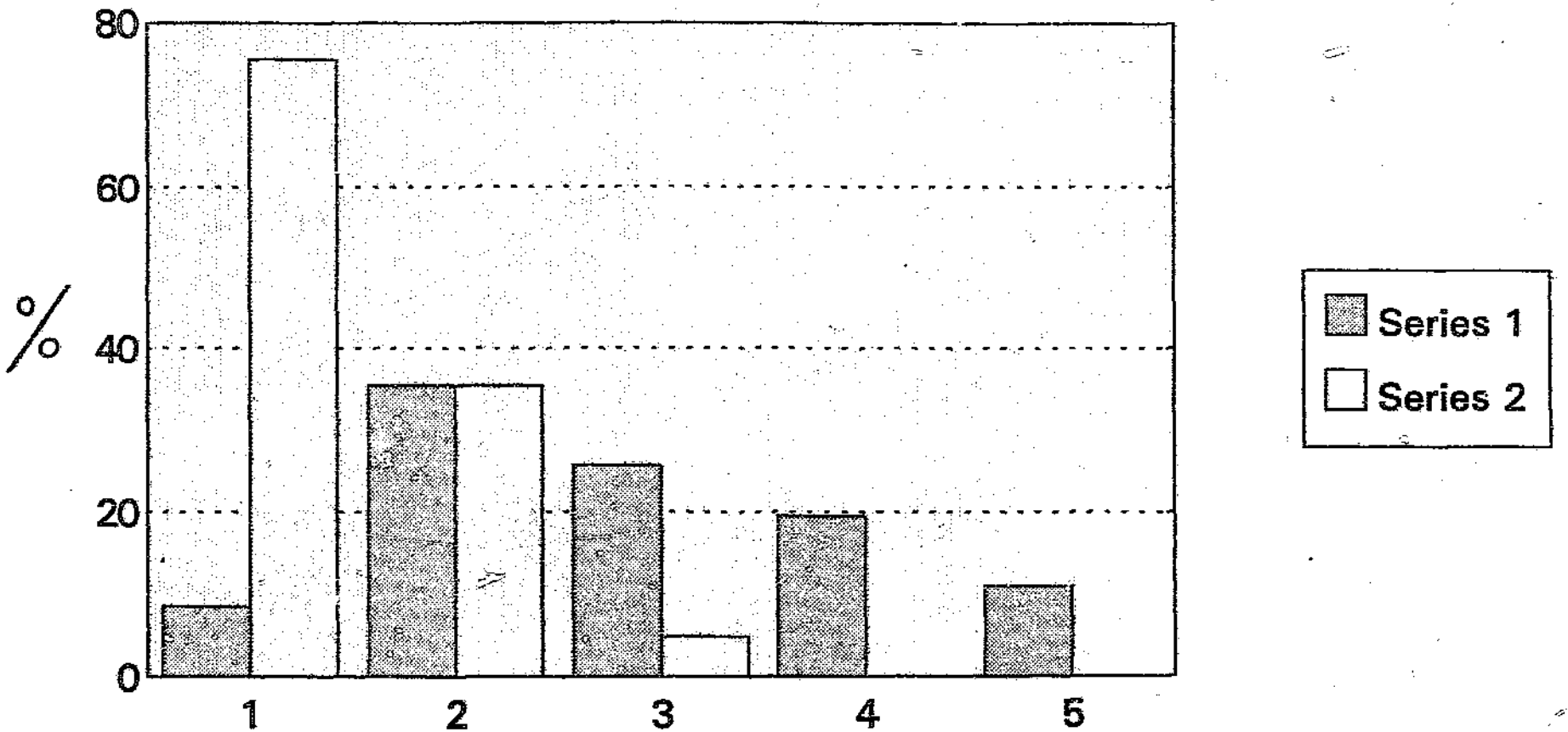
Graph 10

Time from onset to diagnosis



Graph 11

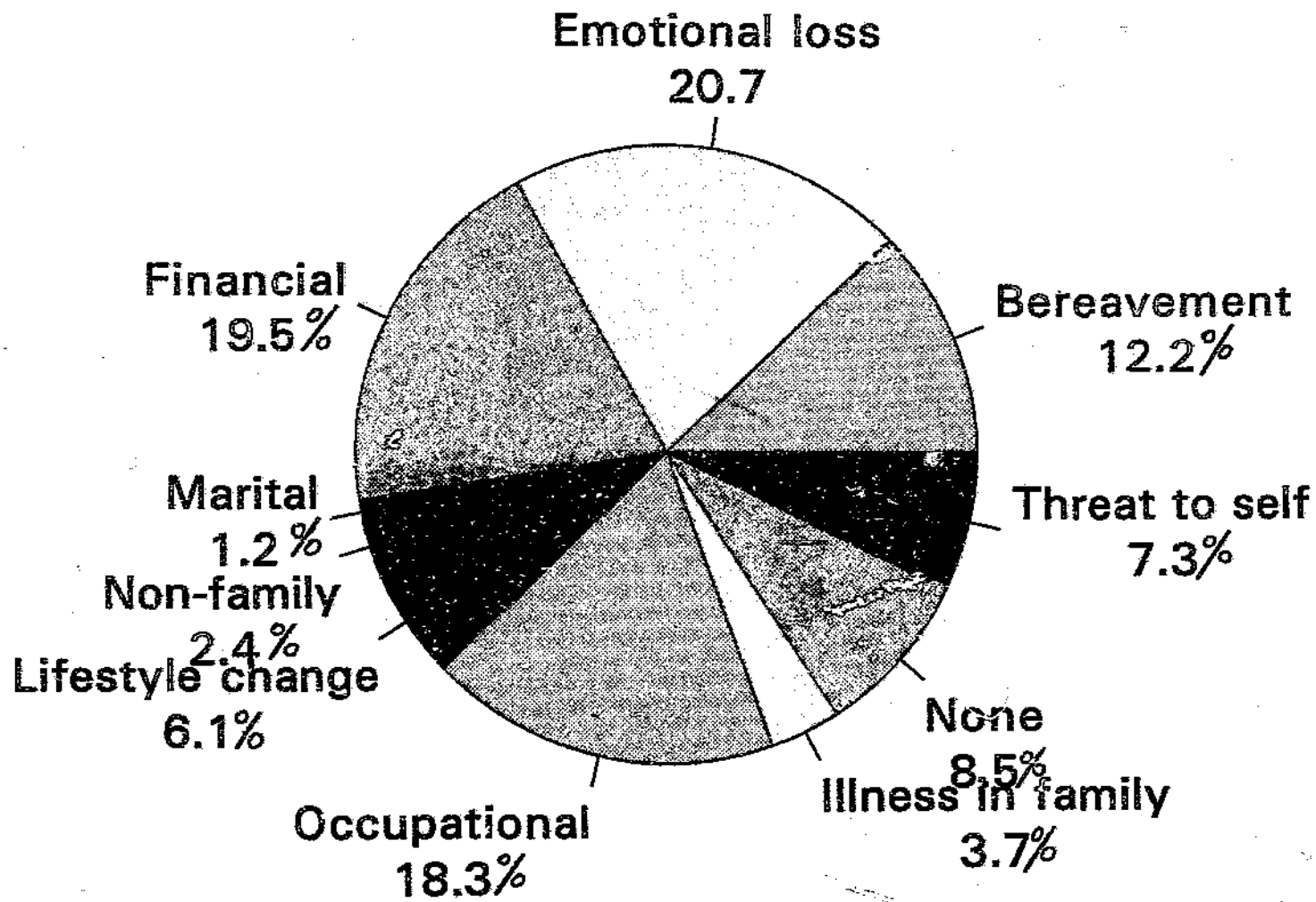
Activity level/ Sport played



1 = none; 2 = < 2 hrs; 3 = 2-5hrs; 4 = 5-7hrs; 5 = 7-10hrs. Series 1 = onset; series 2 = current

Graph 12

Stresses in year prior to onset



Appendix 2

Results of Factor Analysis

Description	Factor	Eigenvalue	V.E.B.O.F	Communalities	F.C.E. Total
Problem-focussed coping: session 1	0.80841	factor 1 = 2.6893	2.689292	0.653519	2.689292
Problem-focussed coping: session 2	0.76731			0.588760	
Problem-focussed coping: session 3	0.89654			0.805581	
Problem-focussed coping: session 4	0.80089			0.641432	
Emotion-focussed coping session 1	0.82830	factor 1 = 2.8910	2.891016	0.686076	2.891016
Emotion-focussed coping: session 2	0.81059			0.657056	
Emotion-focussed coping: session 3	0.88243			0.778679	
Emotion-focussed coping: session 4	0.87704			0.769206	
Coping using social support: session 1	0.68302	factor 1 = 2.3220	2.322033	0.466518	2.322033
Coping using social support: session 2	0.79172			0.626814	
Coping using social support: session 3	0.79307			0.628956	
Coping using social support: session 4	0.77443			0.599745	
Coping using denial: session 1	0.67881	factor 1 = 1.9771	1.977074	0.460787	1.977074
Coping using denial: session 2	0.80614			0.649864	
Coping using denial: session 3	0.69829			0.487611	
Coping using denial: session 4	0.61548			0.378813	

V.E.B.O.F. = Variance explained by one factor; F.C.E. = Final Communality Estimates.

APPENDIX 3

Initial Factor Method: Principal Components

Factor Pattern

	FACTOR1
COSOSUP1	0.68302
COSOSUP2	0.79172
COSOSUP3	0.79307
COSOSUP4	0.77443

Variance explained by each factor

FACTOR1
2.322033

Final Communality Estimates: Total = 2.322033

COSOSUP1	COSOSUP2	COSOSUP3	COSOSUP4
0.466518	0.626814	0.628956	0.599745

Initial Factor Method: Principal Components

Prior Communality Estimates: ONE

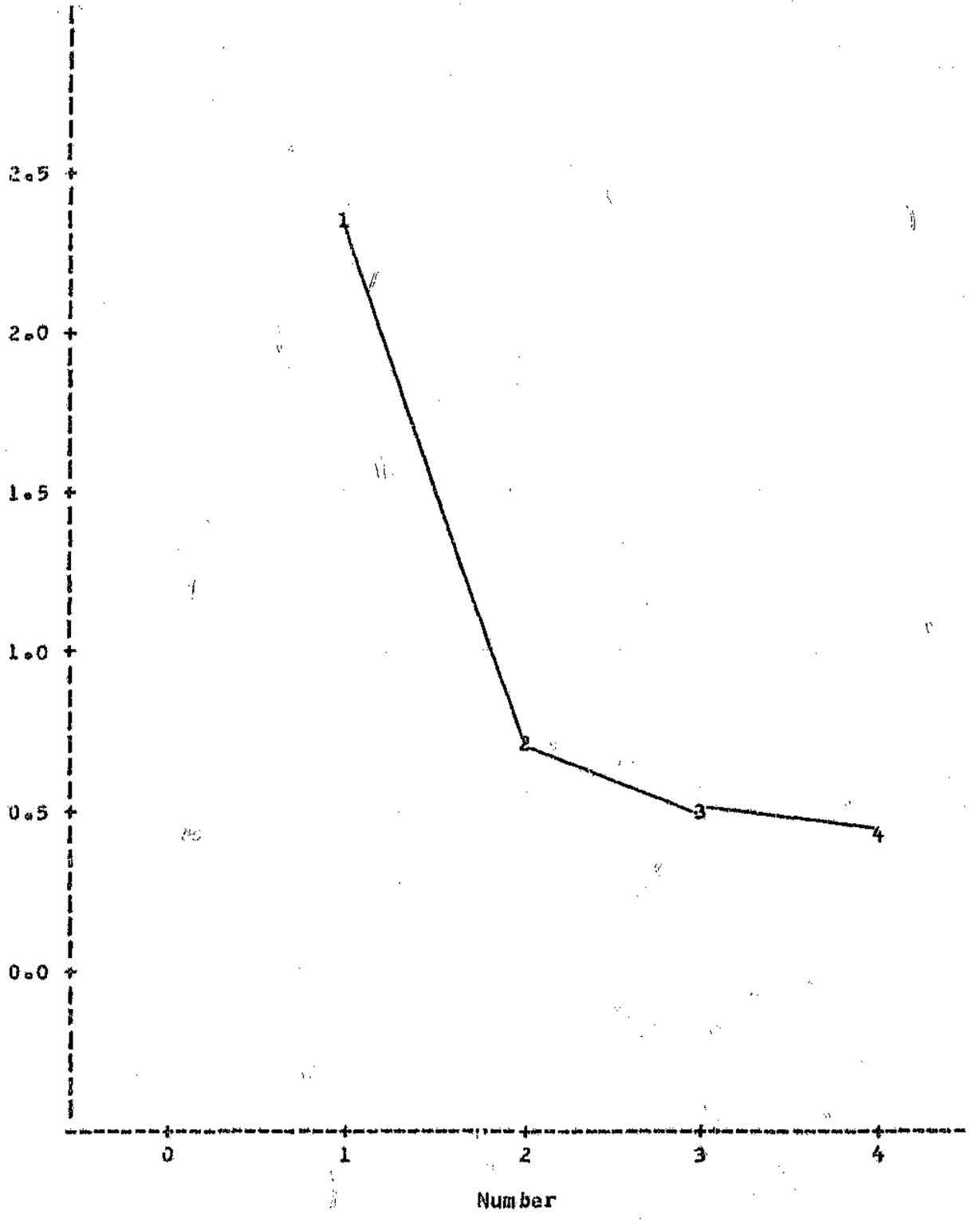
Eigenvalues of the Correlation Matrix: Total = 4 Average = 1

	1	2	3	4
Eigenvalue	2.3220	0.7017	0.5170	0.4592
Difference	1.6203	0.1847	0.0578	
Proportion	0.5805	0.1754	0.1293	0.1148
Cumulative	0.5805	0.7559	0.8852	1.0000

1 factors will be retained by the MINEIGEN criterion.

nitial Factor Method: Principal Components

Scree Plot of Eigenvalues



nitial Factor Method: Principal Components

Factor Pattern

	FACTOR1
CODENY1	0.67881
CODENY2	0.80614
CODENY3	0.69829
CODENY4	0.61548

Variance explained by each factor

FACTOR1
1.977074

Final Communality Estimates: Total = 1.977074

CODENY1	CODENY2	CODENY3	CODENY4
0.460787	0.649864	0.487611	0.378813

nitial Factor Method: Principal Components

Prior Communality Estimates: ONE

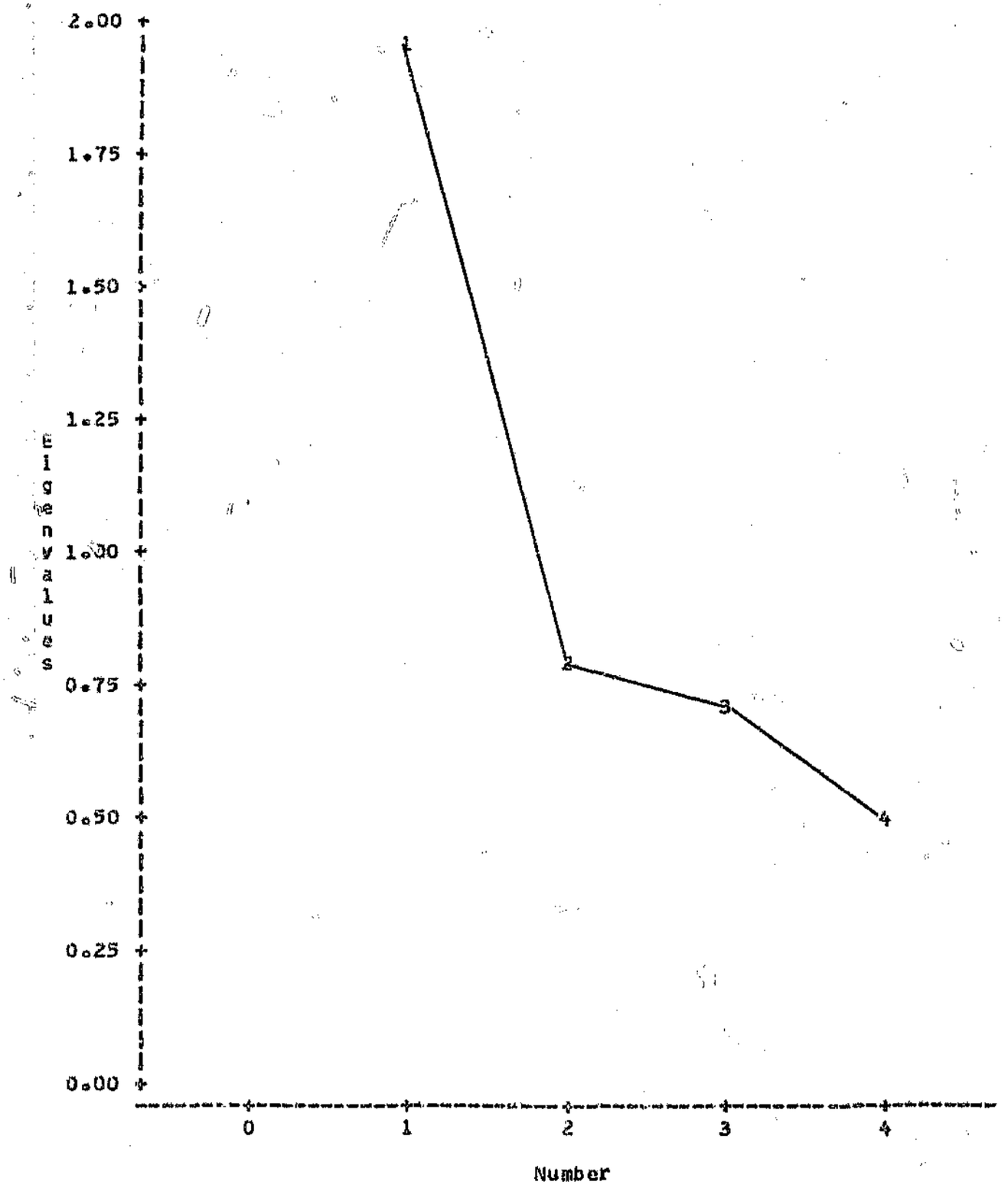
Eigenvalues of the Correlation Matrix: Total = 4 Average = 1

	1	2	3	4
Eigenvalue	1.9771	0.8030	0.7010	0.5189
Difference	1.1740	0.1020	0.1822	
Proportion	0.4943	0.2008	0.1753	0.1297
Cumulative	0.4943	0.6950	0.8703	1.0000

1 factors will be retained by the MINEIGEN criterion.

Initial Factor Method: Principal Components

Scree Plot of Eigenvalues



Author: Biccard Anne-Marie.
Name of thesis: An analysis of the relationship between coping strategies used and incidence of relapse in myalgic encephalomyelitis.

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