CONDITIONS FOR HEALTH BEHAVIOUR CHANGE

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ABSTRACT

The impact of an academic course in health psychology on students' health behaviour is assessed. It was contended that this course motivated students to improve their personal health behaviours, as it contained all the elements necessary for persuasion. It was hypothesised that (a) self-reported health behaviour would improve from pre- to post-course assessment, (b) any improvements would not have been maintained at the follow-up evaluation, (c) the components of the Health Belief Model (HBM) would predict the various health behaviours. The subjects were all third year psychology students at the University of Cape Town, attending an optional course in health psychology. They completed a self-report health behaviour questionnaire (Lifestyle Evaluation Questionnaire) prior to commencement of the course and again at the end of the six week course. At a follow-up, eight months after the completion of the course, (86) students who had completed both previous questions were mailed another (LEQ) questionnaire. They were also requested to complete a questionnaire (based on the HBM), assessing their beliefs about health behaviour (the Lifestyle Beliefs Questionnaire). 42 (49%) subjects returned the questionnaires. A t-test of mean differences was conducted to determine if the four Lifestyle Evaluation Questionnaire (LEQ) factors - food, exercise, drugs and care - had changed significantly over time. Exercise, food and care behaviour had improved significantly from pre- to post-course assessment to follow-up ($p < .05$). Hypothesis one was, therefore, partially supported, and hypothesis two was not supported by the findings. A number of explanations for these findings are proposed. In short, it appears that exercising is regarded as more enjoyable and beneficial by a young population than other preventive health behaviours. The HBM components of benefits, barriers, susceptibility, motivation, cues to action, attitude, and enabling variables were regressed against the four LEQ factors to determine if these HBM components could predict the health behaviours. Benefits predicted exercise and drug use, barriers predicted exercise behaviour, and susceptibility predicted drug use. These three HBM components were found by Janz & Becker's (1984) review to be the most powerful predictors of health behaviours. Limitations of this "naturalistic" study are discussed and it is concluded that persuasive communication is necessary to motivate young, healthy adults to practise positive health behaviours.

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CHAPTER ONE

INTRODUCTION

In this dissertation the relationship between attending a course in health psychology and students' subsequent personal health behaviour is examined. Health behaviour is defined, in this context, as activities undertaken by people believing themselves to be healthy, for the purpose of preventing disease and protecting or promoting their health (Kasl & Cobb, 1966).

A course in health psychology is offered as an optional course to third year psychology students at the University of Cape Town. It is obviously not aimed at changing the students' behaviour, but at presenting an overview of the rapidly developing field of health psychology. Health psychology is concerned with psychological factors involved in health promotion and maintenance, acute and chronic disease prevention and control, rehabilitation, health systems and strategies. Essentially it entails "the application of the theories, methods, and professional skills of psychologists to problems in the prevention and treatment of (physical) illness and the promotion and maintenance of (physical) health" (Lindzey, Thompson & Spring, 1988).

The course comprises four lectures per week for a period of six weeks, with many facets being considered in a review fashion and selected topics, owing to their significance and empirical bases, being discussed in greater depth. They include: the synchronous systems model, concepts of health and illness, primary prevention, health assessment, wellness, life-style adaptations, health beliefs and attitudes, substance abuse, self-destructive behaviours, physical exercise application and promotion, health maintenance, stress, Type A behaviour and the heart, stress management, psychoneuro-immunology, compliance and adherence, humour and life stress.

It is contended that the components of this course (the message content, style and lecturer) fulfil the requirements of a persuasive communication and, in so doing, initiate and motivate

behaviour change amongst some of the recipients of the message. Besides the course itself being a potent instigator of change, the recipients of the message, the students, may also exhibit the necessary characteristics to enable change to occur. There is extensive evidence that individuals who value their health more highly are more inclined to be receptive to messages concerning their health (Lau, Hartman & Ware, 1986; Maiman & Becker, 1974). As the students chose this course from two options, namely psychotherapy and counselling or health psychology, one might assume that they have more of an interest in health and perhaps even value it more highly than those who chose the other option. This topic of persuasive communication is discussed in greater detail in the literature review (See Chapter Two, Section 2.6).

However, although acquisition of accurate information about health is a prerequisite for practising most preventive behaviours, simply providing information is often not sufficient to motivate behavioural change (Hollis, Connor & Matarazzo, 1982; Quadrel & Lau, 1989; Thompson, 1978). Certain mediating variables are important in determining who will initiate such changes and who will not. For this reason, the Health Belief Model was chosen as an organizing framework for explaining health behaviours.

Extensive research has shown that peoples' beliefs and perceptions of consequences of an action affect ensuing behaviour (Haefner & Kirscht, 1970; Kaplan, Atkins & Reinsch, 1984). Beliefs, however, are modifiable, and can change to become congruent with any behavioural change (Becker, Maiman, Kirscht, Haefner, Drachman & Taylor, 1979; Croog & Richards, 1977; Cummings, Becker, Kirscht & Levin, 1982; Haefner & Kirscht, 1970). But modification alone is not always sufficient to maintain the change (Haefner & Kirscht, 1970) as long standing habits may satisfy a variety of needs (Burbach & Schomer, 1987; Haefner & Kirscht, 1970). This issues is discussed in greater detail in the literature review.

Thus, the link between behaviour and beliefs is rather complicated, with numerous variables influencing each of them. The Health Belief Model provides a framework which can

contribute towards understanding how beliefs and resultant behaviours are affected (Becker *et al.*, 1979).

The literature available to date emanates mainly from the United States of America, with fewer contributions from Britain and Europe. Contributions from South Africa are rather meagre in comparison, so the topics covered in the literature review are limited to a Western perspective. This was indeed, a major motivation for conducting this study.

AIMS OF THE STUDY

The objectives of this enquiry were to:

1. Construct a questionnaire based on the premises of the Health Belief Model (the Lifestyle *Beliefs* Questionnaire).

2. Utilise this questionnaire to determine whether the beliefs of the students predict their health behaviour.

3. Determine whether the health psychology course had a significant impact on the students' health behaviour as measured by a separate self-report questionnaire (the Lifestyle *Evaluation* Questionnaire).

4. Determine whether any such behavioural changes were maintained over time (a period of eight months).

CHAPTER TWO

LITERATURE REVIEW

In the previous chapter the motivations for, and aims of, this study were introduced and the areas of directly relevant psychological literature were indicated. Now the changing patterns of disease in Western countries in recent years are considered, and certain pertinent fields of study - health behaviour change, the Health Belief Model, and persuasive communication are examined in greater detail.

2.1 CHANGED PATTERNS OF DISEASE

At the turn of the century the primary causes of mortality were influenza, pneumonia, tuberculosis, and gastroenteritis (Henderson, Hall, & Lipton, 1980; Winett, King, & Altman, 1989) and there was nothing one could do to prevent their occurrence. Between 1910 and 1930 drinking water became chlorinated, milk pasteurized, and food inspected. School children were immunized and by the mid-1940s sulpha drugs and penicillin came into widespread use (Winett, King, & Altman, 1989). Thus, a combination of the identification of the causal organisms and subsequent development of immunizations, along with improvements in a broad range of environmental factors appear to be the major reason for health progress and the prevention and cure of infectious diseases during the early twentieth century (Henderson, Hall, & Lipton, 1980; Winett, King, & Altman, 1989).

In short, communicable diseases provided the major threat to health during the first half of this century and their inherent characteristics necessitated a technological approach for their most effective control.

This remarkable progress in the conquest of infectious diseases has produced a drastic change in the types of medical problems confronting industrialized countries today. In the past 80 years in the United States and most European countries the prevalence of acute infectious disorders has declined while what have been termed the "preventable" disorders, including lung cancer, cardiovascular disease, drug and alcohol abuse, and vehicular

accidents have increased (Matarazzo, Weiss, Herd, Miller, & Weiss, 1984). These chronic diseases and accidents now claim more lives than infectious diseases in many Western countries. Thus, the burden of illness has changed to encompass mainly deaths and disabilities caused by chronic diseases and by conditions such as injuries from accidents, poisonings or violence.

These noncommunicable or chronic diseases are now the problems that require innovative approaches in prevention, control and cure (Henderson, Hall, & Lipton, 1980). Currently, epidemiological data (Matarazzo *et al.*, 1984) suggests that the leading causes of death in the United States population as a whole are heart disease, cancer, cerebrovascular disease, and accidents.

In South Africa the picture is slightly different. Having characteristics of both an industrialized and developing nation we are still fighting the infectious diseases largely eradicated in "first world' countries; but we are seeing increasingly the burden of chronic illness amongst the more affluent in our society. According to the Central Statistical Service in Pretoria diseases of the circulatory system caused 12 000 (12,8%) of deaths in 1990. Infectious and parasitic diseases 9 500 (11%), respiratory 7 000 (8%), and cancer 26 000 (30%) deaths in the same year. Accidents, poisoning and violence claimed almost 10 000 white, coloured and Asian lives; no figures were released for African people. A significant number of deaths had occurred due to cancer: whites 6 090 (18,2%), coloureds 3 083 (12,4%), and Asians 356 (8,4%) (The Argus, 7 August 1992). Thus, even in South Africa only 11 percent of deaths in 1990 were caused by infectious illnesses. A large portion of the remaining premature deaths could, in theory, be prevented.

With the declining importance of infectious diseases and the corresponding increases in death and disability due to chronic diseases, prevention has become urgent, for the chronic diseases are seldom cured. These major chronic afflictions of heart disease, stroke, and cancer require substantial changes in personal behaviour rather than the application of technology for their most effective control. Very few of these problems can be controlled by

doing something to the water supply or prescribing an exotic medication. Most demand persistent, intelligent, personal action that is often distasteful enough to require a relatively high state of motivation for success (Winett, King, & Altman, 1989).

There is growing evidence that detrimental lifestyle patterns and day-to-day health habits are linked to the probability of developing these and other chronic diseases. Furthermore, self- destructive habits may influence not only the development of disease but also general levels of physical and mental well-being (Henderson, Hall, & Lipton, 1980; Lau, Kane, Berry, Ware, & Roy, 1980; Winett, King, & Altman, 1989). Behaviour patterns and habits making substantial contributions to the current burden of disease and injury include cigarette smoking, excessive alcohol consumption, the use of illicit drugs, diets high in cholesterol, saturated fats, and salt, too little physical activity, obesity, and not wearing seat belts (Lau, Quadrel, & Hartman, 1990). Unfortunately, "these behaviours are stubbornly resistant to change and discouragingly subject to relapse" (Miller, 1983, p.6).

A number of studies have shown that a major role in current causes of mortality and morbidity is played by behavioural factors, especially by long standing habits, such as smoking, dietary preferences, and the abuse of alcohol, commonly known as "lifestyle". For example, the Centre for Disease Control (1980, quoted in Miller, 1983) of the U.S. Public Service has estimated that 50% of mortality from the ten leading causes of death in the United States can be traced to lifestyles. The United States Surgeon General's report on the health of Americans emphasized that seven of the ten major causes of death are directly or indirectly related to a set of "health risk" behaviours. Among these behaviours identified as injurious or detrimental to health were obesity, diets with high levels of cholesterol, sedentary lifestyles, cigarette smoking, excessive alcohol consumption, and failure to wear seat belts (Turk, Rudy, & Salovey, 1984). For example, 25% of all cancer deaths and approximately 350 000 premature deaths from heart attack could be avoided each year by modifying just one risk factor: smoking (American Heart Association, 1988, quoted in Taylor, 1990). A 10% weight reduction in men aged 35 to 55 through dietary modifications and exercise would produce an estimated 20% decrease in coronary artery disease

(American Heart Association, 1984, quoted in Taylor, 1990); it would also lower the degree of degenerative arthritis, gastrointestinal cancer, diabetes, stroke and heart attack. In this respect, a dramatic drop in the incidence of cardiovascular disease during the past several years has been cited as evidence that lifestyle changes involving reduction in cigarette smoking, diet modification, control of hypertension, and exercise may be contributing to such a reduction (Evans, 1988).

Health public policy is increasingly stressing that the most cost-effective approach is to persuade the individual to comply with appropriate lifestyle changes. In the United States of America the percentage of gross national product devoted to health care has been climbing steadily, in part because the diseases that are currently most prevalent are chronic in nature and thus require continual treatment and monitoring (Winett, King, & Altman, 1989). In addition to the cost of life and disability there is also the financial cost to be counted. Expensive operations, sick leave, disability pay, and loss of employment all take their toll on individual and state funds. While most nations struggle to control rising health care costs with various advanced treatment-based technologies, less than one percent of the United States health-care budget is earmarked for health promotion and disease prevention (Winett, King, & Altman, 1989). With the recent South African cut backs in health spending emphasis should be placed on preventing the first world chronic disease so that money can be channelled into preventing infectious diseases such as TB which still claim so many lives prematurely.

Because of changing patterns of illness, health promotion and primary prevention have been of increasing concern to researchers and practitioners. Medical care in America has gradually shifted its focus from the treatment of infectious diseases to both the prevention of disease and the promotion of health (Michael, 1982) since it is widely accepted that successful modification of health behaviours may help to reduce both the number of deaths and the incidence of preventable disease (Taylor, 1990). There is growing emphasis on the idea that health policy should place high priority on programmes to change lifestyles in a manner conducive to improved health (Mechanic & Cleary, 1980).

Improvement in personal behaviour is emerging as a promising approach to the reduction of the present causes of death and disability in our society because all of these behaviours or lifestyles are under people's control; therefore, the morbidity and mortality associated with them are preventable, at least in theory. However, health-professionals and the general public have been slow to accept this premise, despite the substantial evidence in favour of it, and even slower to act upon its obvious implications. While the difficulty of the task is recognized, and the conflict with other important values appreciated, lifestyle interventions appear to have high potential benefits. In some instances modest success in altering behaviour of populations has been demonstrated (Farquhar, Maccoby, Wood, Alexander, Breitrose, Brown, Haskell, McAlister, Meyer, Nash, & Stern, 1977). There are a number of logical reasons for this foot-dragging, not least the recentness of the reemergence, after many years of modern neglect, of the historic concept of personal behaviour as a potent tool in the quest for good health.

2.2 CHANGING HEALTH BEHAVIOUR

This current interest and involvement in trying to define, analyze and change self-destructive behaviours stems from a basic shift in the patterns of morbidity and mortality in this country (U.S.A.) and in other modern, industrialized cultures (Henderson *et al.*, 1980).

The acknowledged importance of behaviour change in disease prevention and health promotion has led to increasing efforts on the part of both public and private organisations to promote healthier lifestyles. Psychology has followed suit, as evidenced by the recent emphasis on disease prevention and health promotion (Matarazzo, *et al.*, 1984). Ameliorating today's complex health problems requires initiatives combining perspectives, tools, and methodologies from health-related professions (Winett, King, & Altman, 1989). One of psychology's major contributions to health concerns and problem definition is theory.

Health behaviours are activities undertaken by people, believing themselves to be healthy, for the purpose of preventing disease and protecting or promoting their health (Kasl &

Cobb, 1966) Considerable latitude exists in the definition of health behaviours, which may include seeking activities such as the pursuit of good nutrition, or avoidances such as not smoking (Krick & Sobal, 1990). Harris and Guten (1979) have expanded upon the health behaviour construct and postulated a more general category that they labelled "health protective behaviour" (HPB), defined as "any behaviour performed by a person, regardless of his or her perceived or actual health status, in order to protect, promote, or maintain his or her health, whether or not such behaviour is objectively effective toward that end" (p.18).

Preventive health behaviour has generally been defined in relation to medically approved practices undertaken by healthy individuals for the purpose of preventing disease. In actuality, health *per se* has rarely been assessed. Recent research has considered the concept of preventive health behaviour more broadly in terms of normative "lifestyle" or personal health practices such as sleep, diet and exercise, and even behaviour in relation to unhealthy or dangerous environments (Amir, 1987).

The option to engage in healthy behaviour does not guarantee that it will be done, however, since there are a myriad of barriers to healthy behaviour which first need to be overcome.

Health campaigns relying on information assume that the more individuals know about preventive lifestyle behaviours, the more likely they will be to make the "correct" (healthy) choices *vis a vis* these behaviours. Although acquisition of accurate health information is essential to the practice of most preventive behaviours, it is also clear that simply providing information will not automatically result in a healthier population (Quadrel & Lau, 1989).

One reason for slow or nonexistent change in these unhealthy behaviours is suggested by the label that is given to them: "lifestyle". Styles of living involve habitual modes of behaviour that are, like all habits, very difficult to change (Lau, Quadrel, & Hartman, 1990).

And, unfortunately, much self-destructive behaviour is not accompanied by unpleasant symptoms and goes unnoticed. Working with asymptomatic persons to alter risk factors requires intervention models which go beyond those used in the traditional treatment of

patients motivated by sickness or other dysfunction. Barie (1969, quoted in Hollis, Connor, & Matarazzo, 1982) has provided a compelling portrayal of what it means for a person to adopt an "at risk" as opposed to a "sick" role (Kasl & Cobb, 1966). The at-risk individual "feels fine" but is often asked to comply with an unpleasant behavioural, dietary, or medical regimen on an indefinite and often permanent basis. Compliance produces little or no rewarding physical feedback and typically elicits only minimal or short-term acknowledgement and support from the family, social, or work environment. Thus the person must suffer the responsibilities and aggravations of a chronic treatment in the absence of signs and symptoms of disease, sympathy, and tangible evidence of the value of compliance. This lack of naturally occurring reinforcers is consistent with the observed difficulties associated with compliance and adherence (Hollis, Connor, & Matarazzo, 1982).

In addition, self-destructive behaviours have to be considered in their entirety - that is, they may be risky or dangerous but may also bring benefits to the person. Some benefits, such as smoking, consuming alcohol, or overeating, may be compelling to the individual. Still other benefits an individual could accrue are the social rewards of conformity to self-destructive group behaviour such as poor eating, smoking, and alcohol habits, which may be supported by subcultural norms (Henderson, Hall, & Lipton, 1980).

It comes as no surprise that people are reluctant to alter patterns that represent powerful, predictable, and immediate sources of gratification which are deeply ingrained in the social and cultural contexts in which they live. For many the consumption of rich foods, alcohol and cigarettes provides both sensual gratification and a wide variety of both potent psychological, social, and economic rewards. Rich food is a way for some to impress friends and pamper business associates. Yet another source of resistance to change is simple inertia. People tend to enjoy and feel comfortable with the familiar and avoid that which is new, different or unknown (Hollis, Connor, Matarazzo, 1982).

2.3 THE CONTRIBUTION OF PSYCHOLOGY TO HEALTH EDUCATION

Influencing health behaviour is a natural point for intervention by psychologists. Social psychologists have developed a detailed and impressive literature on social influence. Behaviourally oriented clinical psychologists have demonstrated successful approaches for the management of difficult problems such as obesity. And, more recently, health psychologists have applied a complex array of cognitive and behavioural change techniques to the practice of preventive health behaviours. In most cases, they have achieved at least a modest degree of success, both in modifying health habits and in preventing them from ever developing (Matarazzo *et al.*, 1984; Taylor, 1987).

Nevertheless, recent evidence suggests that some health behaviours are very recalcitrant. The literature demonstrates that behavioural interventions mat have modest rather than strong effects. Further, the long-term success rates for most interventions tend to be disappointing (Kaplan, 1984).

An unanswered question in existing research is whether people who engage in a given health behaviour are more likely to engage in other health practices as well. That issue addresses the question of whether there is an overall positive health orientation that results in the adoption of health behaviours as a set, or whether health behaviours are more independently determined (Krick & Sobal, 1990). An investigation by Krick and Sobal (1990) examined how health protective behaviours were related to each other. It revealed six underlying dimensions which were associated with socio-demographic variables; higher education being associated with healthier behaviour. This factor analysis suggested that there is no one "health protective" behaviour dimension that either is or is not adopted by individuals.

Harris and Guten surveyed a large sample from the general population and noted that the majority of those surveyed reported that they performed some behaviour or set of behaviours to protect, promote, or maintain their health. The Harris and Guten study illustrates several important points. Large numbers of people are concerned about their

health and engage in a great variety of behaviours that they believe will protect or promote health. Moreover, these authors also noted that people who engaged in some health protective behaviours (HPB) did not necessarily engage in other identified HPBs. These behaviours are fairly independent of each other. That is, there does not seem to be one group of people who perform most of the "healthy" behaviours (and/or do not take the unhealthy risks) and another group who perform most of the "unhealthy" behaviours (and do not perform healthy ones (Harris & Guten, 1979). These data tend to contradict suggestions that there is a general health orientation and that people who are high on this dimension will likely carry out many HPBs, whereas those who are low on the dimension will carry out few (Turk, Rudy, & Salovey, 1984).

One of the possible reasons why health habits predict each other only modestly, and their interrelations decline with age (Mechanic, 1979) is because each health habit has a complex pattern of etiology, maintenance, change, and relapse. Consequently, it is often difficult to develop intervention programmes that will appeal to a broad segment of the population to change some targeted health habit. Although individualized appeals often have the greatest impact on behaviour, such methods are expensive and intensive (Taylor, 1990).

Consequently, important implications from the finding that health behaviours exist in multidimensional patterns are:

1) General exhortation to clients about adopting a healthy lifestyle will probably do little to encourage the clients to adopt and maintain a broad range of health behaviours.

2) Counselling about one type of health behaviour may not necessarily spill over to preventive behaviours of other kinds.

3) Knowing a client practices one health risking behaviour does not necessarily indicate their engagement in other harmful practices (Krick & Sobal, 1990).

To be useful, health education aimed at lifestyle change seems to require several characteristics:

1) The program should be targeted to the "worried well," those who have become aware of their vulnerability to certain of their own behaviours.

2) Group presentations are often helpful as a means of providing social support for attitudinal changes that may be necessary precursors for changes in health behaviours.

3) There is some evidence that programs are more effective when they ask for changes of behaviours in several areas, possibly because this permits greater opportunity for individual commitment to an area of change that is personally meaningful (Meyer & Henderson, 1974).

Despite many forces working against change, many people do quit smoking, alter their diets, use seat belts, and engage in other practices for the sake of their health. Sometimes these changes are relatively easy and economical (eg. seat belts), sometimes they entail considerable time and energy (eg. jogging) or monetary expense (eg. regular medical and dental check-ups).

The desire to keep people healthy rather than wait to treat them after they become ill has been the impetus for much work on the development of the healthy lifestyle and the modification of faulty health habits. Although a number of conceptual models have been developed both to explain existing health practices and as impeti for changing faulty ones, there is now considerable convergence on the beliefs that contribute to a given health practice. This conceptual convergence has helped to clarify the difficulty and complexity of actually modifying health behaviours.

2.4 RELAPSE

In the past two decades a plethora of intervention procedures have been developed that have proven effective in modifying a wide variety of target behaviours. Threat of disease, the physician's authority, or a desire to take up a new lifestyle are all capable of motivating a change in health behaviour. Despite success in being able to initiate changes in behaviour, we are still grappling with the difficulties involved in maintaining behavioural change over time and across situations (Marlatt & Gordon, 1980). Too often, temptation and other pressures to relapse abound and prove irresistible.

When major shifts in daily habit patterns occur rapidly, frustration and feelings of deprivation are typical and often lead first to occasional and then permanent slips back into old behaviour patterns. Relapse curves for various treatment areas (eg. smoking, weight-loss, dietary change, and alcohol use) are amazingly consistent (Hunt & Matarazzo, 1973) and the search for a quick easy method of altering complex behaviours is now recognized as unrealistic by most experts (Hollis, Connor, & Matarazzo, 1982).

Perhaps the most important problem for future research is that of preventing relapse (Marlatt & Gordon, 1985). The often- observed phenomenon is that, after successfully altering a health practice on their own for weeks or even months, many individuals revert to their former behaviours (Brownell, Marlatt, Lichtenstein, & Wilson, 1986). In this context, it becomes essential to consider not only the short term effects of interventions designed to modify health habits but also their long range effectiveness, focusing especially on factors that undermine long-term maintenance of short-term change (Taylor, 1990).

Factors contributing to this loss of treatment effects have been hypothesized. One explanation is that in many studies active treatment periods are limited to a month or so. This relatively short period of time may not be sufficient for many individuals to acquire and maintain new behaviours.

Marlatt and Gordon (1980) conducted research on the determinants of recidivism, the tendency to relapse into a previous condition or mode of behaviour. They found commonalities of relapse for addictions such as heroin, alcohol and smoking. About two thirds of relapses across these problem behaviours occur within the first ninety days following treatment. Marlatt and Gordon (1980) suggested that there may be common behavioural and cognitive components associated with relapse.

They compiled categories for classification of relapse episodes. The first category, intrapersonal / environmental determinants, is used whenever the relapse episode involves a response to primarily psychological or physical events (for example, coping with intrapersonal emotional states, giving in to "internal" urges, etc.), or a response to a nonpersonal environmental event (eg. misfortune, accident, financial loss, etc.). Here the emphasis is on precipitating events in which another person or group of individuals is not a significant factor. The second major category, interpersonal determinants, applies whenever the relapse episode does involve the significant influence of other individuals (for example, coping with interpersonal conflict, social pressure, etc.). They found that over three quarters (76 percent) of all the relapse episodes fell into just three categories: coping with negative emotional states, social pressure, and coping with interpersonal conflict.

Drawing upon the determinants of relapse they obtained from their study, Marlatt and Gordon (1980) constructed a theoretical model of the relapse process based on a cognitive-behavioural orientation. In this model they assume that the individual, while maintaining abstinence (or complying with other absolute rules governing behaviour) experiences a perceived sense of personal control over the target behaviour. The perception of control will continue until the individual encounters a high-risk situation. A high-risk situation is defined broadly as any situation that poses a threat to the individual's sense of control and increases the risk of potential relapse. In many of these situations it seems likely that the person experiences a challenge to his or her ongoing sense of personal control. Whether or not a relapse occurs depends largely upon the individual's capacity to engage in an adequate coping response. If the individual is able to execute an effective coping response (for

example, being assertive in counteracting social pressures) in the high-risk situation, the probability of relapse will decrease significantly.

Successful mastery of one problematic situation is often associated with an expectation of being able to cope successfully with the next challenging event (Marlatt & Gordon, 1980). This increased expectancy of being able to cope with successive high-risk situations as they develop is closely associated with Bandura's notion of self-efficacy (Bandura, 1977) Self-efficacy can be defined as an individual's expectations concerning performance on an impending task. If a person does not expect to do well in coping with these problematic situations, a sense of decreased self-efficacy develops. As the duration of the abstinence period increases, and the individual is able to cope successfully with more and more high-risk situations, the perception of control and self-efficacy will increase in a cumulative fashion.

What happens if a coping response to the high-risk situation is not performed? It may be the case that the person has never learned the coping skills involved, or ~~that~~ the appropriate response is inhibited by fear or anxiety. Whatever the reason, if a coping response is not forthcoming, the person is likely to experience a decrease in self-efficacy, coupled with an increased sense of helplessness and a tendency to "give in" to the situation. The mode of behaviour shifts from one of active coping to one of passive yielding. "It's no use, I can't handle this," is a common reaction. As self-efficacy drops in the precipitating high-risk situation, it is likely that one's expectations for coping with subsequent problematic situations will drop accordingly. If the next situation involves dealing with the temptation, the stage is set for a probable relapse (Marlatt & Gordon, 1980).

To the extent that this behaviour has been used as a means of dealing with stress in the past, the attractiveness of the substance or activity will increase considerably in the current high-risk situation. Teaching skills that may help an individual cope successfully with a relapse, either in terms of preventing one from occurring altogether or by minimizing the extent of

the relapse if it does occur, would seem to be a matter of common sense (Marlatt & Gordon, 1980).

2.5 PREVENTIVE HEALTH BEHAVIOUR IN RELATION TO DEMOGRAPHIC VARIABLES

An association between preventive health practices and various demographic variables has been noted in the literature, but the relationship does not appear to be very strong and the evidence is inconsistent (Norman, 1985, quoted in Amir, 1987).

Data available on the relationship between preventive health practices and age suggests that, overall, the prevalence of favourable health practices increases with age (Harris & Guten, 1979). This appears to be so even after the selective survival of healthy individuals is accounted for. Harris and Guten found age to be moderately correlated with health practices such as sleep, diet, relaxation and work practices, but only weakly related to safety and preventive care practices such as seeking check-ups. Coburn and Pope (1974), however, found that some health practices such as exercise and dental check-ups decline with increasing age.

In an analysis of nine demographic and socio-psychological correlates of preventive health behaviour (Coburn & Pope, 1974) socio-economic status was found to be the single most important predictor variable (followed by age). Why should a person's general socio-economic status influence his or her preventive health actions? Knowledge is a necessary, but not a sufficient, condition for action. It might, therefore, be postulated that the greater the knowledge of health and health matters, the greater the likelihood of action being taken congruent with a scientific and rational approach to preventive health (Coburn & Pope, 1974).

It appears that the demographic factor with the strongest association with preventive health behaviour is socio-economic status. Most studies have found a small positive association between higher socio-economic status and undertaking more preventive health behaviours.

Nevertheless, the amount of variance in health behaviour explained by social class is quite low, usually less than 10% (Amir, 1987). Of the components of SES, education and income are usually found to be the dominant factors. Education has a pervasive influence on health actions both directly , and, we may assume, indirectly, through its effects on such things as income and social participation (Coburn & Pope, 1974).

Krick and Sobal (1990) also found education was most strongly related to performing positive health behaviours. More educated respondents reported more regular exercise, less sedative use and less smoking. Respondents from families of higher income were more likely to report routine exercise, more drinking, more planned exercise, less sedative use and more general health behaviours (Krick & Sobal, 1990). They propose that individuals with higher levels of education tend to read newspaper and magazine materials about health promotion more often and can more fully comprehend them, enabling them to regularly update their knowledge about health promotion behaviours.

Gender differences in preventive health behaviour have not always been found, but those that do occur generally suggest that women may undertake more preventive practices (Norman, 1985, quoted in Amir, 1987, p.356). A study by Mechanic and Cleary (1980) revealed that the variables most substantially related to an index of positive health behaviour are being female and having more education.

Identification of subpopulations might facilitate appropriate targeting of health education efforts for specific habits. Each behaviour or group of behaviours may have its own unique set of socio-demographic correlates and, therefore, require separate examination when associated attitudes, behaviours or other characteristics are analyzed. Psychological or social characteristics conducive to adoption of some health behaviours might not be helpful with others (Krick & Sobal, 1990).

Efforts to influence health and illness behaviours may be especially important in the young age group, because many of the health-compromising behaviours seen in adults begin at this age (Millstein & Irwin, 1987). When the programmes are offered to participants before

their behavioural patterns have become rigid - eg. university age or earlier - there is good reason to be hopeful about the long-range impact of well designed and carefully evaluated health education programmes (Cormier, Prefontaine, McDonald, & Stuart, 1980).

Socio-demographically, the population under study, that is university students, have important distinct characteristics. They are the well educated, affluent members of society who are likely to suffer heart disease, stress disorders, car accidents, and cancer as a result of their lifestyle, so they are an important target population for preventing these illnesses.

2.6 PERSUASIVE COMMUNICATION

It is one thing to educate people about their health and about what they can do to improve it. It is quite another to persuade individuals actually to do the healthier thing(s) about which they have learned. In a truly rational world where health and life are of value, the rather straightforward approach of informing persons of why and how they can promote their health should suffice. In the real world, however, the provision of even highly credible information and recommendations has been notoriously ineffective in altering health practices (Hollis, Connor, & Matarazzo, 1982). Although probably necessary, knowledge alone seems insufficient to overcome the many and potent forces maintaining unhealthy patterns (Thompson, 1978).

To make sound lifestyle decisions, people need appropriate facts, a firm rationale, and clear instructions and guidelines for change. It is a common and not implausible assumption that destructive personal habits stem from specific maladaptive attitudes which are based on a lack of knowledge. This view implies that as knowledge deficits and misconceptions are corrected, first attitudes and then behaviours will change accordingly. Though knowledge, in and of itself, rarely leads to lasting habit change, it unquestionably serves a necessary function. A crucial issue, then, is how to package information so that it is meaningful and palatable to the targeted consumer or audience.

Experiments in the area of communication and persuasion have shown that a number of variables affect the success of an influence attempt. "An effective, persuasive communication is one which is thought to emanate from an expert and trustworthy source which is able to capture and hold the receiver's attention while it conveys an easily comprehensible message and which offers the receiver clear and realistic channels of action in which to express his (or her) agreement. No one of these aspects can be overlooked except at the peril of the entire enterprise" (Gross, 1971, quoted in Lau, 1980, p.85).

In his information processing model of persuasion, McGuire (1974, in Rimer & Glassman, 1984) acknowledges that for promotional messages to be effective, recipients must not only be exposed to, read, and understand messages, they must, eventually, be persuaded by that message to change their behaviour.

McGuire (1972, in Greene & Simons-Morton, 1984) has organised the study of persuasive communication into five major components:(1) source variables; (2) message variables; (3) channel variables; (4) receiver variables; and (5) destination variables. Theoretically, if one could understand the relationships between all these variables, given sufficient time and resources, one could persuade a significant proportion of people to do just about anything.

2.6.1 Source Variables

The influence of who gives the message depends on how acceptable that source is to the receiver. The acceptability of the source depends on the receiver's perceptions of how credible, powerful, attractive, and unbiased the source appears to be. The more acceptable the source, the more effective the message. Receiver perceptions regarding the source can be influenced by the selection of the source, the context of the message, symbolic and overt references, the content of the message, and other factors. Implicitly, there are more and less influential ways of selecting and presenting the source for different types of receivers and different target behaviours (Winett, King, & Altman, 1989).

The role of the health educator can best be described as a change agent. The task of a change agent is to create, stimulate, and/or facilitate change. In general, according to Rogers and Shoemaker (1971, in Winett, King, & Altman, 1989), the greater the number and variety of contacts with clients a change agent has, the greater the likelihood of success. Because people who are alike (homophyllic) tend to communicate more often with each other than do those who are not alike (heterophyllic), most change agents tend to have greater contact with the small percentage of clients who are more innovative, of higher social class, and are more educated than the rest - in short, more like the change agent. Communication is not only less frequent but also less effective when a low degree of homophyly is present, unless the source has a high degree of empathy with the receiver.

The diffusion and acceptance of new information imparted by an active change agent has been found to depend on the extent to which the people they are attempting to persuade regard them as credible, trustworthy, knowledgeable, attractive, and similar to themselves with respect to basic beliefs, values, and experiences of life (McGuire, 1968). Thus, it is less important that the change agent possesses any of these qualities objectively than it is that he/she is perceived to possess them by the people they are attempting to persuade (Berkanovic, 1976).

Two of the more important factors in determining receptivity to a persuasive communication are credibility and attractiveness of the communicator. Credibility is a function of both perceived expertise and perceived trustworthiness. Experimental results have shown unequivocally that there is a positive relationship between the credibility of the communicator and the extent of opinion change. Change agents are only as successful as they are credible to the client. According to Rogers and Shoemaker (1971, in Winett, King, & Altman, 1989), change agents are more likely to be credible if their programmes fit the client's cultural beliefs and values. Social psychological research suggests that exposure to one or two messages from a credible source should be enough for most people to perceive the message and perhaps accept it (Lau *et al.* 1980).

It is not surprising to learn that experts are more believable, but it also appears that their influence is dependent upon the motives they are assumed to have. If the communicator appears to have a vested interest in the audience's acceptance of the message, influence will be less likely (Hollis, Connor, & Matarazzo, 1982). Another variable of obvious importance is the extent of the discrepancy between the opinion advocated by the communicator and the precommunication opinion of the recipient.

According to Bandura's social cognitive theory a key strategy during acquisition of new behaviours is modelling. The effectiveness of modelling depends on its type (eg. face-to-face modelling, participant modelling), how well characteristics of the models fit observers (programme participants), and the outcomes experienced by models contingent on appropriate performances (Winett, King, Altman, 1989). Effective modelling procedures should lead to appropriate outcome expectations (eg. the specific benefits of a modified diet or smoking cessation) and increased self-efficacy about abilities to perform new behaviours (eg. first attempts at coping with reduced nicotine intake and subsequent withdrawal symptoms). The next step entails setting specific goals, performing the behaviours, and receiving feedback. Considerable social support may be necessary for these early, often difficult, steps. The initial performance and feedback resulting in satisfaction or some dissatisfaction affects self-efficacy and modifies performance (eg. take one step back and smoke a slightly higher nicotine cigarette).

2.6.2 Message Variables

The goal of persuasive communication is to get the target population to believe the message, perhaps even act upon it. A communication that succeeds in being persuasive is not only understood by the target population, but is also believed, appreciated and valued. The study of persuasive communication seeks to find out just how to present messages most effectively to persuade the largest number of people to take a specific action (Winett, King, & Altman, 1989).

Before bombarding people with facts, their interests, goals, health belief systems and current level of understanding should be assessed and taken into account. Unless the information is relevant to a value or goal the client regards as important, its impact will be minimal, regardless of the quality of its presentation (Hollis, Connor, Matarazzo, 1982).

Although most people value good health, increasing risk of disease may not be a particularly salient issue for many who themselves as currently healthy. Attempts to increase a person's sense of perceived vulnerability to disease may make health more salient, or instead, increase discomfort or dissonance and lead to denial, selective forgetting, repression or other forms of avoidance. An alternative approach is to appeal to other values currently more relevant to the individual. The key is to discover and respond to that which is important and of value to that individual (Hollis, Connor, & Matarazzo, 1982).

Success in promoting healthy behaviour may depend in part on the appropriate "framing" of promotional messages - that is, altering the language that information is couched in without changing the substantive information contained in the message (Quadrel & Lau, 1989). The style, content, and organisation of the message is an important aspect of persuasive communication. One can appeal to reason, to emotions, to fear, to images, and to associations. One can repeat the same message over and over, or change it slightly. One can manipulate the order of the content or the relative emphasis. One can attempt to emphasize or to minimize discrepancies between the current action and the advocated one.

Persuasion is defined by the presentation of arguments, and the accumulated research in social psychology has generally supported the view that increasing the number of arguments in a message enhances its persuasive impact (Maddux & Rogers, 1980). Petty and Cacioppo (1984) have shown that the mere quantity of arguments rather than their quality may serve to persuade people to change their opinions, perhaps by enhancing issue-relevant thinking. Previous analyses of this effect have suggested that increasing the number of arguments in a message enhances persuasion by giving people more information to think about (Petty & Cacioppo, 1984). Increasing the number of arguments in a message can induce attitude

change even if people are not thinking about the arguments at all. If people are unmotivated or unable to think about the message, and no other salient cues are available, they might invoke the simple but reasonable decision rule, "the more arguments the better", and their attitudes might change in the absence of thinking about or scrutinizing the arguments (Petty & Cacioppo, 1984).

Other characteristics of the message itself can affect persuasion. For example, it is usually better to present both sides of an issue so that the audience is prepared for counter-persuasion attempts (McGuire, 1968, quoted in Berkanovic, 1976). Similarly, it is usually best to draw the explicit conclusion implied by the message, since there will be less opportunity for misunderstanding (Zimbardo & Ebbesen, 1970).

Perhaps the most crucial consideration in presenting relevant information and recommendations is the complexity of the message. Short words and sentences should be used, recommendations should be specific and important ideas should be repeated (Hollis, Connor, & Matarazzo, 1982). Repeated exposure and practice are essential when complex behaviour patterns are being altered.

2.6.3 Channel Variables

The choice of medium or channel is also important in persuasive communication. The answer to this question depends on the budget, the audience, the message, and the target behaviours.

2.6.4 Receiver Variables

The nature of the intended audience determines all the other factors in the formula for developing persuasive communications. All the other variables depend heavily on the receiver. Learning as much as possible about the current and relevant knowledge, attitudes, and practices of the intended receivers cannot be overemphasized. There is some evidence in the literature that some people are more easily persuaded than others. Theoretically, everyone is susceptible to some appeals.

2.6.5 Destination Variables

The destination, outcome, or extent and type of change desired is obviously very important in persuasive communication. Some actions are more difficult to influence than others. Specific, divisible, reversible effects are more easily targeted than more general ones. Certain messages would be more effective for certain outcomes.

All these variables must be considered together, interactively, to determine the most effective communication. Unfortunately, not much is known about each of the variables, and most of what is known concerns product adoption, not health behaviour adoption (Winett, King, & Altman, 1989).

What does this mean in the context of health promotion ? The best measure of persuasion, of course, is behaviour change. Various theories explaining health behaviour have been proposed over the last few decades, including the Health Belief Model (Rosenstock, 1974).

2.7 MODELS EXPLAINING HEALTH BEHAVIOUR

Over the years, models of behavioural change applicable to health education have drawn largely on the field of social psychology. The studies based upon these models have focused on attitudes, beliefs, values, social norms and social influence (Hunt & Martin, 1988). A number of conceptually similar theoretical paradigms have been offered by behavioural scientists to describe conditions under which health-related actions are more likely to be practised. During the past twenty to twenty-five years, a number of conceptual models have been proposed to attempt an explanation of individual health-related behaviours.

This study draws upon a particular formulation known as the Health Belief Model (HBM) (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977). This model was chosen as it has received the most direct attention and study and has influenced much research (Rosenstock, 1974). In addition it was felt that many of the other models claiming to explain health-related decisions have drawn their basic premises from the HBM and are merely reformulations with slightly different emphases and terminology.

2.8 THE HEALTH BELIEF MODEL

Researchers have applied this model as a conceptual formulation for understanding why individuals do or do not engage in a variety of health-related actions. It is used as a organizing framework for explaining and predicting acceptance of health and medical care recommendations (Janz & Becker, 1984).

2.8.1 History of the Model

This particular explanation of health motivations and practices was originally developed by a group of investigators associated with the Behavioural Studies Section of the U.S. Public Health Service from approximately 1950 to 1960. They were all social psychologists by training and their work represented the first systematic effort to put the study of health behaviour on a firm scientific basis. It grew out of an attempt to understand "the widespread failure of people to accept disease preventives or screening tests for the early detection of asymptomatic disease" (Janz & Becker, 1984, p.2). They sought to reduce the bewildering multitude of items that might affect one's decision to take a particular health action to a manageable set of priority factors. Once this was accomplished, other researchers would have a format for their work, something to build upon, to refine, or perhaps to reject in whole or part. More important, working health educators would be provided with a logical explanation of the determinants of health behaviour, thus enabling them to plan their programmes more effectively (Winett, King, & Altman, 1989).

The original formulators of the HBM were heavily influenced, as they approached their task, by the theoretical background provided in their professional training. In the words of Rosenstock (in Becker, 1974, p.2), one of the original group,

> All of us exhibited a phenomenological orientation, that it is the world of the perceiver that determines what he (or she) will do and not the physical environment, except as the physical environment comes to be represented in the mind of the behaving individual.

Rosenstock is saying that real things and real events have no direct effects on our decisions. It is rather our perceptions of these objects or events that are important.

Since its development the HBM has served as a framework for a significant number of studies relating not only to preventive health behaviour (Rosenstock, 1974), but to illness (Kirscht, 1974, in Croog & Richards, 1977), the sick role (Becker, 1974), and to chronic illness behaviour (Kasl, 1974).

The HBM, as its name implies, stresses beliefs; these constitute the variables of interest to the followers of this model. A belief is something one accepts as the truth, regardless of whether or not it is actually true in objective terms. Whether a particular belief happens to valid or not in the eyes of others has little to do with its effect on the holder's behaviour. Far more important are the expectancies that a particular belief evokes about a certain course of behaviour and how important these expectancies, in terms of consequences or benefits, may be to the individual. Each belief thus consists of two components:

1) a cognitive element (ie. what might happen);

2) an affective component (ie. how deeply one cares about the consequences or benefits).

Cues constitute a second major component of the HBM and serve to mobilize or bring relevant beliefs into consciousness and thus to bear upon a particular health decision (Winett, King, & Altman, 1989).

2.8.2 Dimensions of the Model

The basic components of the HBM are derived from a well established body of psychological and behavioural theory whose various models hypothesize that behaviour depends mainly upon two variables:

1) The value placed by an individual on a particular goal;

2) The individual's estimate of the likelihood that a given action will achieve that goal (Maiman & Becker, 1974).

When these variables were conceptualized in the context of health related behaviour, the correspondences were:

1) The desire to avoid illness (or if ill, to get well);

2) The belief that a specific health action will prevent (or ameliorate) illness. (That is, the individual's estimate of the threat of illness, and of being able, through personal action, to reduce that threat)(Janz & Becker, 1984).

The original HBM proposed that for a person to take an action to avoid disease, the person must hold the following beliefs:

1) He/she is personally susceptible to the disease (perceived susceptibility);

2) The disease would have at least moderately serious consequences (perceived severity);

3) Taking a particular action would be beneficial by either reducing susceptibility to the disease or by reducing the seriousness of the disease should it occur (perceived benefits) (Hallal, 1982).

Barriers such as cost, inconvenience, pain, or embarrassment should not outweigh the perceived benefits of the proposed health action (Hallal, 1982), and some cue to action is necessary to trigger the desired health behaviour. The cue could be internal (eg. A symptom) or external (eg. impact of mass media). Demographic, sociopsychological, and structural variables were considered important only as they served to modify a person's perceptions (Rosenstock, 1974).

Now each of the four core components of the model will be discussed in more detail, as outlined by Janz and Becker (1984).

2.8.2.1 Perceived susceptibility

This dimension refers to one's subjective perception of the risk of contracting a condition. Individuals vary widely in their feelings of personal vulnerability to a condition. People often may not respond to suggestions that they obtain "flu shots" because they do not view influenza as a serious disease. However, if, for example, cases of bubonic plague should appear in a seaport community, there would probably be a very positive response to the call for immunization (Winett, King, & Altman, 1989).

2.8.2.2 Perceived severity

Feelings concerning the seriousness of contracting an illness (or of leaving it untreated) also vary from person to person. This dimension includes evaluations of both medical/clinical consequences (eg. death, disability and pain) and possible social consequences (eg. effects of the conditions on work, family life and social relations). Individual perceptions of personal susceptibility to specific illnesses or accidents often vary widely from any realistic appraisal of their statistical probability. The nature and intensity of these perceptions may significantly affect their willingness to take preventive action (Winett, King, & Altman, 1989).

2.8.2.3 Perceived benefits (effectiveness of the precaution)

While acceptance of personal susceptibility to a condition also believed to be serious was held to produce a force leading to behaviour, it did not define the particular course of action that was likely to be taken. This was hypothesized to depend upon beliefs regarding the effectiveness of the various actions available in reducing the disease threat. Thus a "sufficiently threatened" individual would not be expected to accept the recommended health action unless it was perceived as feasible and efficacious. Thus, individuals generally must believe that the recommended health action will actually do some good if they are to comply. Some long-time cigarette smokers, for example, seem to believe that "I've smoked

for so many years that it's to late to quit. It couldn't help now anyway - so why bother?" (Winett, King, & Altman, 1989).

2.8.2.4 Perceived barriers (costs of adopting the precaution)

The potentially negative aspects of a particular health action may act as impediments to undertaking the recommended behaviour. A kind of cost-benefit analysis is thought to occur wherein the individual weighs the effectiveness of the action against perceptions that it may be expensive, dangerous, unpleasant, inconvenient, time consuming and so forth. Using the example of the smoker again, he or she may view the task of quitting as difficult, unpleasant, and carrying with it the likelihood of gaining unneeded kilogrammes.

The combined levels of susceptibility and severity provided the energy or force to act and the perception of benefits (less barriers) provided a preferred source of action (Rosenstock, 1974). Further detail is also presented in Janz & Becker (1984).

2.8.2.5 Cue to action

It was also felt that some stimulus was necessary to trigger the decision-making process. This "cue to action" might be internal (that is, symptoms) or external (for example, mass media communications, interpersonal interactions) (Janz & Becker, 1984). These are evaluated and incorporated into the person's decision to act (Kirscht, 1974, in Croog & Richards, 1977).

2.8.2.6 Other factors

It is assumed that diverse demographic, sociopsychological, and structural variables might, in any given instance, affect the individual's perception and thus indirectly influence health-related behaviour (Janz & Becker, 1984). Demographic, social, structural and personality factors are included in some versions of the model as modifying factors (Becker, Drachman, & Kirscht, 1972; Rosenstock, 1974) since in theory they indirectly influence actual behaviour.

2.8.3 How the Model Works

This and other similar models suggest that individuals maintain certain perceptions about their susceptibility to a particular disease and about the potential seriousness of that disease. Their decision to take some action to prevent the disease depends upon the degree to which they perceive that disease as directly threatening them. Their behaviour is a result of simply weighing the benefits of the preventive action against the barriers to that action. A cue or stimulus provided in the appropriate context may tip the scales in favour of taking the desired action (Lau *et al.*, 1980; Mullen, Hersey, & Iverson, 1987; Hunt & Martin, 1988). In order to change behaviour, the person must first be motivated to change and then must know how to change. Beliefs and knowledge can certainly affect motivation and may lead to knowing how to change, but while they may be necessary for behaviour change, they are not always sufficient. The motivation to change must be stronger than the motivation to maintain the old behaviour. Nevertheless, belief change and knowledge are valuable outcomes in any behaviour change programme; if any extrinsic event alters the balance of motivation away from the old behaviour, the new beliefs and knowledge can guide the change (Lau *et al.*, 1980).

In summary, the major elements which constitute the HBM (see Figure 1) are:

1) The threat posed by an illness, comprised of the likelihood of its occurrence (perceived susceptibility) and its potential for causing physical harm and interfering with social functioning (perceived severity);

2) Belief in the efficacy or value of a behaviour in reducing the threat (perceived benefits);

3) Estimates of physical, psychological, financial or other costs involved in the proposed action (perceived barriers).

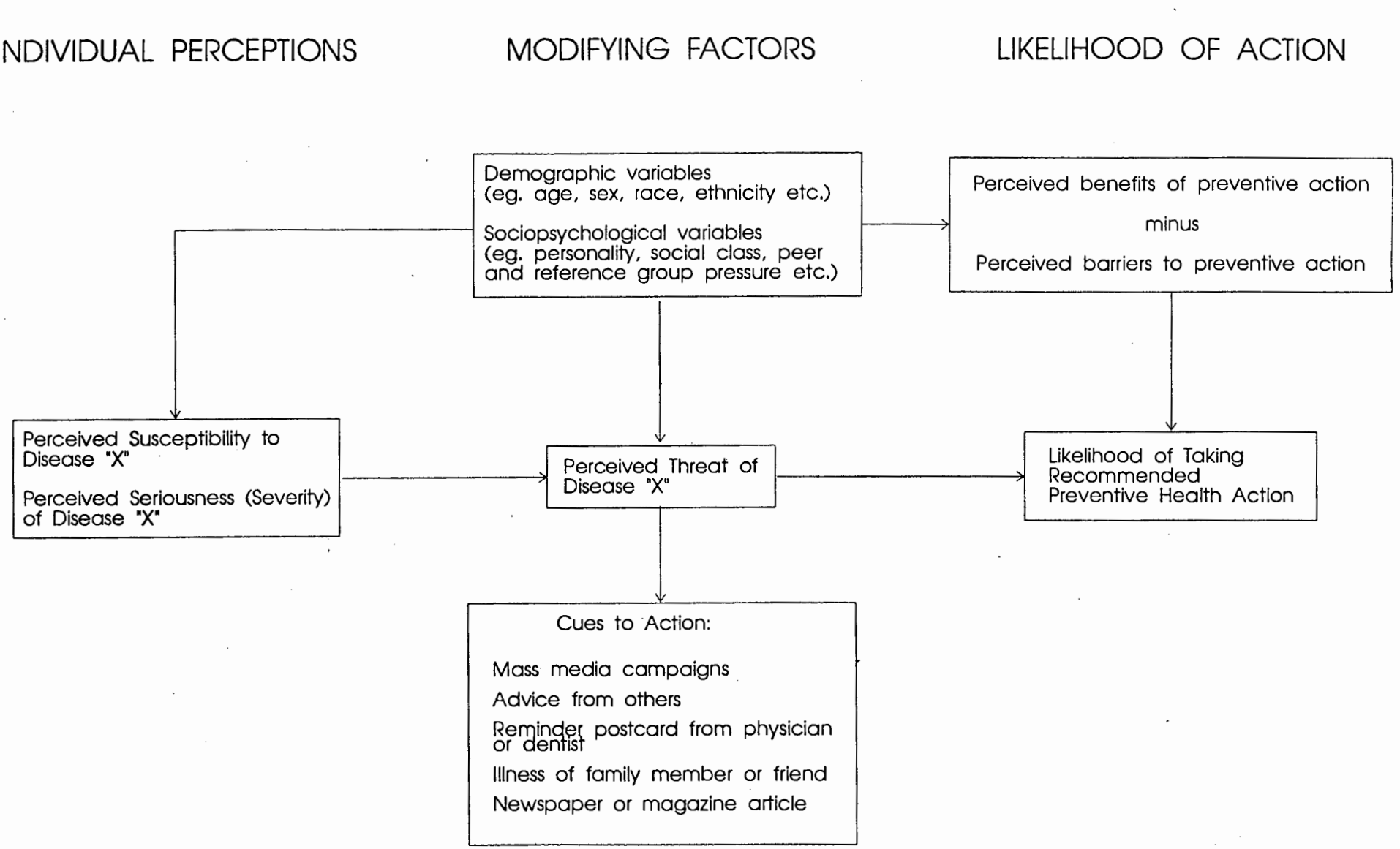

Figure 1. Original Formulation of the Health Belief Model (Becker & Maiman, 1975).

The model also postulates that a relevant stimulus or "cue to action" must occur to trigger the appropriate health behaviour. This stimulus might be internal (eg. symptoms or bodily states) or external (eg. health communications or advice from others). While it was understood that diverse demographic and sociopsychological variables might, in any given instance, affect health motivations and perceptions, these variables were not seen as directly causal of compliance (Becker *et al.*, 1977).

2.8.4 Revised Health Belief Model

The model was revised and expanded by Becker and his associates (Becker & Maiman, 1975; Becker, Haefner, Kasl, Kirscht, Maiman, & Rosenstock, 1977; Becker, Maiman, Kirscht, Haefner, & Drachman, 1977) to account for more types of health behaviour than only recommended preventive health action (Harris & Guten, 1979; Hallal, 1982). Many of the model's original elements have been reformulated to accommodate this expanded focus and several new elements have been added to incorporate research findings available after the original work by Rosenstock (Harris & Guten, 1979).

In addition to the four salient categories, a number of other areas of beliefs were included. The most significant change was the inclusion of the individual's generalized concept of, and the degree of importance he or she attaches to, health matters in general (Hallal, 1982). The original model had a disease avoidance orientation; yet it is likely that positive health motivations exist, and also, that individuals often engage in actions having health implications but for reasons unrelated to health. Since persons are differentially disposed to approach various classes of positive incentives, the category "health motivation" was added to represent differences in degree of concern about health matters. (See Section 2.8.4.1). Similarly, because the earlier model focused exclusively on the index condition, more general measures of vulnerability to, and worry about, illnesses were created to tap broader perceptions of health threat. The concepts of "feelings of control over health matters", "faith in doctors and medical care", and intention to comply were added as well. Finally, demographic, structural and enabling factors found to be predictive in other studies were

included as mediating variables in the revised model (Becker *et al*, 1977) illustrated in Figure 2 below:

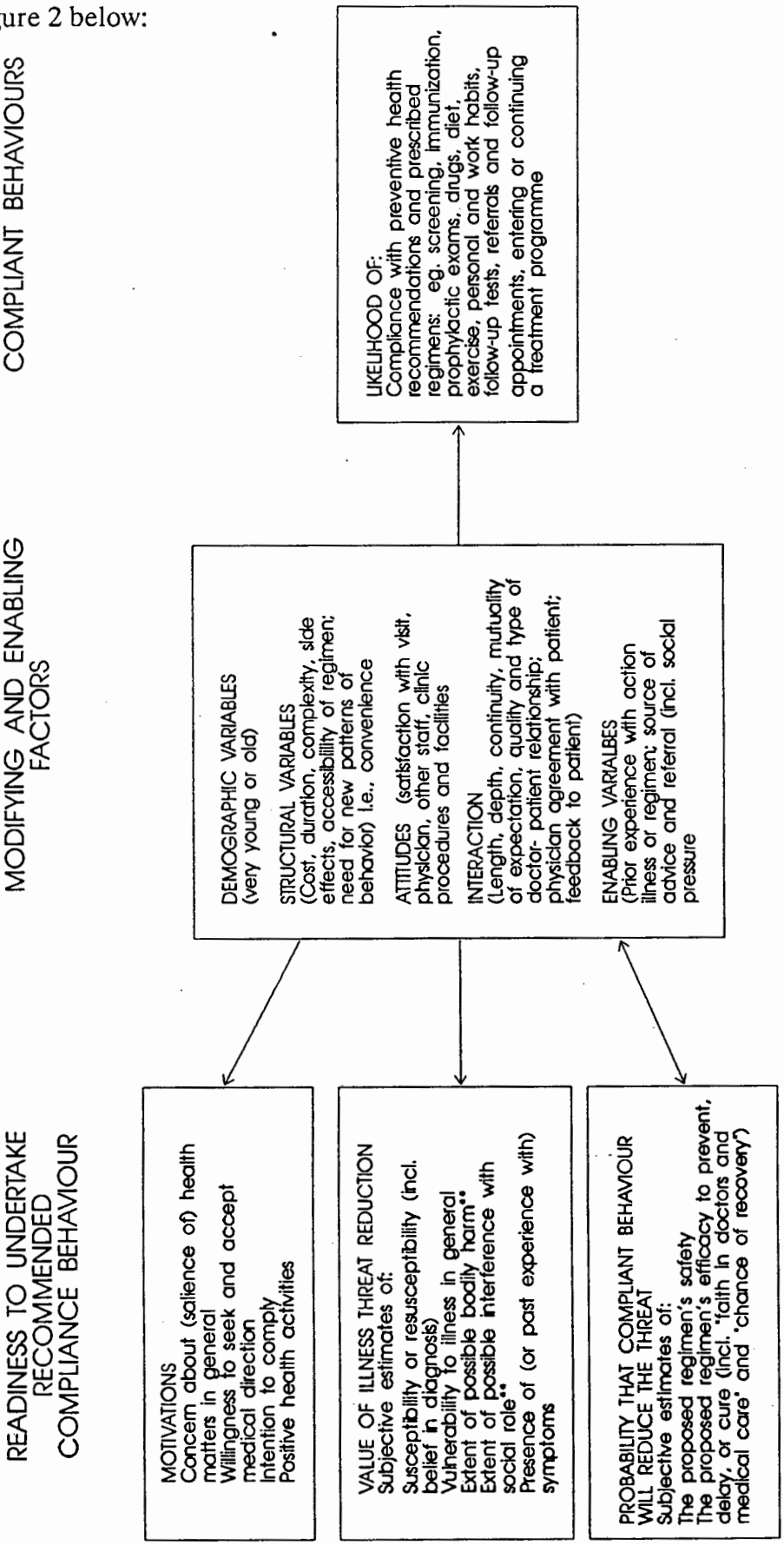

Figure 2. Revised formulation of the Health Belief Model (after Becker & Maiman, 1965)

2.8.4.1 General Health Motivation

Health motivation was not part of the original model; it was initially felt that perceived susceptibility and severity beliefs provided sufficient motivation to engage in preventive health behaviour. Reevaluation of the model by Becker and associates led to the addition of a specific factor representing positive interest and concern about health as a principal component (Becker, Drachman, & Kirscht, 1972, 1974; Becker, Maiman, Kirscht, Haefner, & Drachmann, 1977).

The concept of health as a value is one that has been surprisingly under utilized in health research. Researchers have frequently assumed that all people uniformly place a very high value on health. In the context of life threatening disease it is probably a safe assumption that the salience of health and the value placed on it is consistently high. However, in other health-related domains, such as preventive health behaviour, where health actions are undertaken in an asymptomatic state for the purpose of preventing illness and remaining healthy, The value placed on health may not be so high (Lau, Hartman, & Ware, 1986).

Motivation is seen as a variable state of readiness to act, based on the reward value attributed by the individual to his anticipation of the outcome of his/her action (Lau, Hartman, & Ware, 1986). The effects of the individual's beliefs regarding his/her susceptibility to a disease, the seriousness of it, and the likely benefits of taking action are mediated by how highly he values health. Since any behaviour requires the expenditure of time, energy, and resources, all of which are finite, the level of motivation to enhance health will influence the issue of whether there are conflicting values the person wishes to achieve (Berkanovic, 1976). Accordingly, the proper multiplicative combination of susceptibility, seriousness, and efficacy should predict health related behaviour, but only among those who value health highly (Becker *et al.*, 1972; Maiman & Becker, 1974; Mullen *et al.*, 1987).

People seem to vary considerably in their belief that they really have an ability to cause any change in their life by their own actions. Some people feel that they are "in charge" and that they can "make things happen". Others, however, feel that their lives are more or less in the

hands of fate - "what's going to happen is going to happen" - and, consequently, they are not generally motivated to take action in an attempt to improve the odds. This quality of being either internally or externally directed is commonly termed locus of control. These two variables - health importance and degree of confidence in personal control - are thought to provide a general background of readiness for action or apathy, as the case may be, against which the four major belief categories of seriousness, susceptibility, benefits, and barriers exert their collective effect (Winett, King, & Altman, 1989). Locus of control is not included explicitly because it is believed to be incorporated within other elements of the model.

2.8.4.2 Self-efficacy

Rosenstock, Strecher, and Becker (1988) posit a revised explanatory model which incorporates self-efficacy into the HBM. Bandura's concept of "self-efficacy" may be defined as "the conviction that one can successfully execute the behaviour required to produce the outcomes" (Bandura, 1977, p.193). Specifically, self-efficacy is proposed as a separate independent variable along with the traditional HBM variables.

The HBM has ignored efficacy expectations (in the Bandura definition) and thus may have failed to account for as much variance in behaviour as it might. It is not difficult to see why self-efficacy was never explicitly incorporated into the HBM. The behavioural focus of the early model was on circumscribed preventive actions, such as accepting immunizations, which generally were simple behaviours to perform. Since it is likely that most prospective members of target groups for those programmes had adequate self-efficacy for performing the recommended behaviour, that dimension was never even recognized (Rosenstock *et al.*, 1988).

The situation is vastly different when working with chronic illnesses, particularly those requiring long-term changes. The problems involved in modifying lifelong habits of eating, drinking, exercising, and smoking are, obviously, far more difficult to surmount than are those for accepting a one-time immunization or screening test. It requires a good deal of confidence that one can actually alter such lifestyles before successful intervention is

possible. Thus, for behavioural change to succeed, people must (as the HBM theorizes) have an incentive to take action, feel threatened by their current behavioural patterns and believe that change of a specific kind will be beneficial by resulting in a valued outcome at acceptable cost, but they must also feel themselves competent (self-efficacious) to implement that change. A growing body of literature supports the importance of self-efficacy in helping to account for initiation and maintenance of behavioural change (Bandura, 1986; Rosenstock, 1988).

The model is predicated on the premise that "health" is a highly valued concern or goal for most individuals (therefore this model is appropriate for this thesis because subjects chose the health psychology course presumably because of interest or concern about health) and also that cues to action are widely prevalent (the course duration) ; where these conditions are not satisfied, the model is not likely to be useful in, or relevant to, explaining behaviour (Janz & Becker, 1984).

Thus, the HBM is a "rational decision model in which the call to action in the form of recognized cues receives a response that seems appropriate to the individual in the light of what he or she believes to be true about the health condition, the action, the situation, and him- or her-self" (Berkanovic, 1976, p.94).

2.8.5 Support for the Health Belief Model

A great many investigators have demonstrated that these above- mentioned variables are important predictors of preventive health behaviour (Janz & Becker, 1984).

The HBM was initially formulated in an attempt to explain the use of such preventive services as tuberculosis screening, dental examinations and the acceptance of the polio vaccine (Becker, 1974, quoted in Berkanovic, 1976). Since that time a large number of studies have been undertaken in which one or more of the causal variables identified in the model have been examined for their effect on a wide range of health behaviours (Berkanovic, 1976).

Much of the research that has been conducted on the relationship of the HBM variables to both preventive health behaviour and illness behaviour has demonstrated support for the model. High levels of perceived susceptibility, perceived severity, and perceived benefits are positively correlated with a variety of desirable health behaviours (Hallal, 1982).

Until 1977 the model had never been applied in research on behaviour related to chronic illness. Using a prospective design Becker and associates (1977) attempted to evaluate the model's ability to explain and predict mothers' adherence to a dietary regimen for their obese children. Based on the findings of this study, the HBM appears to be useful in the explanation and prediction of a mother's adherence to a diet regimen for her child. Variables significantly associated with the child's weight change were found in each major category of the model (Becker *et al.*, 1977). The data lend further support for a model of individual health related behaviour incorporating estimates of health motives, disease threat, and benefits of action. Whether taken singly or in combination, these dimensions were shown to account for substantial amounts of the variance in this study's measures of dietary compliance and appointment keeping (Becker *et al.*, 1977).

A descriptive, correlational study was undertaken by Hallal (1982) in order to determine if there were differences in the health beliefs, health locus of control, and self-concept of adult women who practise breast self-examination (BSE) as compared to those women who do not. Analysis of the data revealed there were differences between the practicer and non-practicer groups in terms of health beliefs, health locus of control and self concept. Specifically, analysis revealed that being a practiser of BSE was correlated with higher levels of health beliefs and higher self-concept levels. Practisers tended to be less inclined to have a health locus of control that depended upon a powerful other (Hallal, 1982). The research hypothesis concerning health beliefs was supported in this study. There was a significant correlation between practising BSE and obtaining higher scores on each of the subscales of the health beliefs instrument. A more impressive level of significance was achieved for "perceived benefits" than for "perceived susceptibility" (Hallal, 1982).

A study by Croog & Richards (1977) found that health beliefs, as measured by the HBM were not found to be related to the massive drop in smoking behaviour amongst men who had experienced a myocardial infarction. They suggest that the model may apply more to people with the usual motivational states than to those under a direct threat of the magnitude of a life- threatening crisis (Croog & Richards, 1977). However, Weinberger, Greene, Mamlin & Jerin (1981) obtained data that suggested that health beliefs can discriminate between groups of current smokers, as well as smokers from ex-smokers.

O'Connell, Price, Roberts, Jurs, & McKinley (1985) utilized the HBM to predict dieting and exercising behaviour of obese and non-obese adolescents. It was found that benefits of dieting was the most powerful predictor of dieting behaviour for the obese adolescents, whereas susceptibility to the causes of obesity best explained present dieting behaviour of non-obese adolescents. Exercising behaviour of obese teenagers was best explained by cues to exercising. No HBM variables were significant in predicting exercising behaviour of non-obese adolescents.

A review by Janz & Becker (1984) of HBM-related investigations that were published between 1974 and 1984 was carried out. They concluded that "research published during the past decade provides substantial support for the usefulness of the HBM as a framework for understanding individual's health-related behaviour" (Janz & Becker, 1984, p.36).

They created a significance ratio wherein the number of positive and statistically significant findings for an HBM dimension are divided by the total number of studies which reported significance levels for that dimension. Examination of this ratio across the 29 investigations reviewed (Janz & Becker, 1984) revealed that the best results are obtained by the barriers dimension, followed (in descending order) by benefits, susceptibility, and severity.

These investigations provide very substantial evidence supporting HBM dimensions as important contributors to the explanation and prediction of individual's health-related behaviours (Janz & Becker, 1984). "While there are many other extant models of health-

related behaviour (Cummings, Becker, & Maile, 1980) we know of none approaching the HBM in terms of research attention or corroboration" (Janz & Becker, 1984, p.41).

Support for the HBM has come primarily from studies in which data on individual beliefs about health behaviour was gathered simultaneously, although the review by Janz & Becker (1984) concluded that findings from prospective studies were "at least as favourable as those obtained from retrospective research" (Janz & Becker, 1984, p.1). Becker and associates (1975) in an excellent review of selected research studies about the HBM stated that "while no one would claim that the Health Belief Model is complete in accounting for all variations in how people behave with respect to their health, sufficient evidence has now been amassed to conclude that the Model provides a workable theoretical and practical foundation" (in Hallal, 1982, p.139).

2.8.6 Limitations of the Model

Despite the impressive body of findings linking HBM dimensions to health actions, it is important to remember that the HBM is a psychosocial model; as such, it is limited to accounting for as much of the variance in individuals' health-related behaviour as can be explained by their attitudes and beliefs (Janz & Becker, 1984).

Other forces influence the health action as well. For example:

1) Some behaviours have a substantial habitual component obviating any ongoing psychosocial decision-making process (eg. smoking, tooth-brushing).

2) Many health-related behaviours are undertaken for what are ostensibly non-health reasons (eg. dieting to appear more attractive, stopping smoking or jogging to attain social approval).

3) Economic and / or environmental factors may prevent an individual from undertaking a preferred course of action (eg. a worker in a hazardous environment, resident in a city with high levels of air pollution.

The model is also predicated on the premise that "health" is a highly valued concern or goal for most individuals and also that cues to action are widely prevalent; where these conditions are not satisfied, the model is not likely to be useful in, or relevant to, explaining behaviour (Janz & Becker, 1984).

In addition, models of preventive health behaviour that focus on illness avoidance may be most useful in describing the behaviour of people who view health primarily in terms of the absence of illness. Individuals who view health in more diverse terms may fail to behave in ways consistent with the predictions of a disease-avoidant model (Millstein & Irwin, 1987).

CHAPTER THREE

HYPOTHESES

In this chapter the hypotheses formulated to test the aims of the study, presented in Chapter One, are outlined. The hypotheses detailed below are based on the literature reviewed of health behaviour change and the Health Belief Model.

Two different questionnaires are used to test the hypotheses of the study. The Lifestyle Evaluation Questionnaire (LEQ) measures health *behaviour*, and the Lifestyle Beliefs Questionnaire (LBQ) (based on the Health Belief Model) focuses on *beliefs* about health behaviours.

3.1 HYPOTHESIS ONE

Subjects' self-reported health behaviours (as measured by the Lifestyle Evaluation Questionnaire) will improve from initial measurement at the commencement of the health psychology course to subsequent measurement after completion of the course.

3.2 HYPOTHESIS TWO

Any improvement in the students' self-reported health behaviours (as measured by the Lifestyle Evaluation Questionnaire) from initial to post-course assessment will not be maintained at the time of the follow-up assessment. That is, it is predicted that scores will return to their initial level.

3.3 HYPOTHESIS THREE : HEALTH BELIEF MODEL HYPOTHESES

The hypotheses about each of the Health Belief Model subcomponents are discussed individually below. To make reference easier the number of the item(s) corresponding to each component of the Health Belief Model in the Lifestyle Beliefs Questionnaire appear in brackets.

3.3.1 Motivation

An association is hypothesised between health behaviours and motivation. Specifically, in terms of the Health Belief Model subcomponents, a positive association between an improvement in a subject's health behaviour and concern about health matters in general (2), willingness to seek and accept medical direction (5, 6, 7), participation in positive health activities (3), and intention to comply (4).

3.3.2 Susceptibility and severity (value of illness threat reduction)

A positive relationship is hypothesised between subjects' health behaviour and their subjective estimates of susceptibility to various illnesses (8, 9), vulnerability to illness in general (10) and extent of possibly bodily harm (11).

3.3.3 Benefits (probability that positive health behaviours will reduce the threat)

An association is hypothesised between subjective beliefs of the benefits of healthy behaviour and performing those behaviours. A negative relationship is hypothesised between the possible harm such a lifestyle might have (12, 13) and performing healthy behaviours. A positive association is predicted between the efficacy of healthy behaviour in preventing, delaying or curing ill-health (15, 16) and a subject performing such positive behaviours.

3.3.4 Barriers (structural variables)

A number of barriers associated with not performing positive health behaviours are hypothesized. A positive association between failing to engage in a healthy lifestyle and financial difficulties (17), the accessibility of a healthy lifestyle (18), inconvenience (19), need for new patterns of behaviour (20), complexity of carrying out positive health behaviours (21), and possible side-effects (13) are all hypothesized.

3.3.5 Attitudes

A positive association is predicted between satisfaction with a healthy lifestyle (22) and more positive health behaviour.

3.3.6 Cue to action

A cue to action (28) would be associated with positive health behaviour.

3.3.7 Enabling variables

A positive association is hypothesised between an internal locus of control (that is, believing that the subjects' healthy behaviour will prevent future health problems) (16) and healthy lifestyle behaviours. A lack of self-efficacy (23, 24, 26) would be negatively associated with performing healthy behavior. Prior experience with attempts to improve lifestyle (27), present and past sources of motivation (25, 28, 29) and social support (30, 31) are all hypothesized to be positively associated with a healthy lifestyle.

CHAPTER FOUR

METHODOLOGY

In the previous chapter the hypotheses formulated to examine the aims of this study were presented. In this chapter the methodology employed to test these hypotheses is outlined.

4.1 DESIGN OF THE STUDY

This is basically a field study as the effect of a naturally occurring intervention (the course in health psychology) upon a self-selected group of subjects (those students who chose to take the course) is examined. Thus the independent variable is the health psychology course and the dependent variable, any changes in the health behaviour of those students attending the course. As it would have been unethical to randomly assign some students to the course in health psychology and some to the course in psychotherapy and counselling, the study cannot be termed an experiment, but rather a non-manipulative descriptive study postulating various relationships between the variables of interest. In addition, because of the self-selection of the students into the different courses offered, no control group was utilised as it was felt that the groups might differ on many important dimensions relevant to the study, such as the amount they value health, and any such confounding variables might obscure differences on the dependent variables between the groups. Also, as was mentioned in the Literature Review (Chapter Two, Section 2.8.4.2), the Health Belief Model cannot account for the health behaviour of those people who do not (or can be assumed not to) value health highly (Janz & Becker, 1984).

The subjects' health behaviour was assessed by means of a self-report measure - the Lifestyle Evaluation Questionnaire at Time One, prior to the commencement of the health psychology course; at Time Two, directly after completion of the course; and at Time Three, eight months after the end of the course. In addition, at Time Three, a second questionnaire was completed by the subjects, the Lifestyle Beliefs Questionnaire (based on the Health Belief Model) measuring beliefs about positive health behaviours.

Figure 3 illustrates the design of the study.

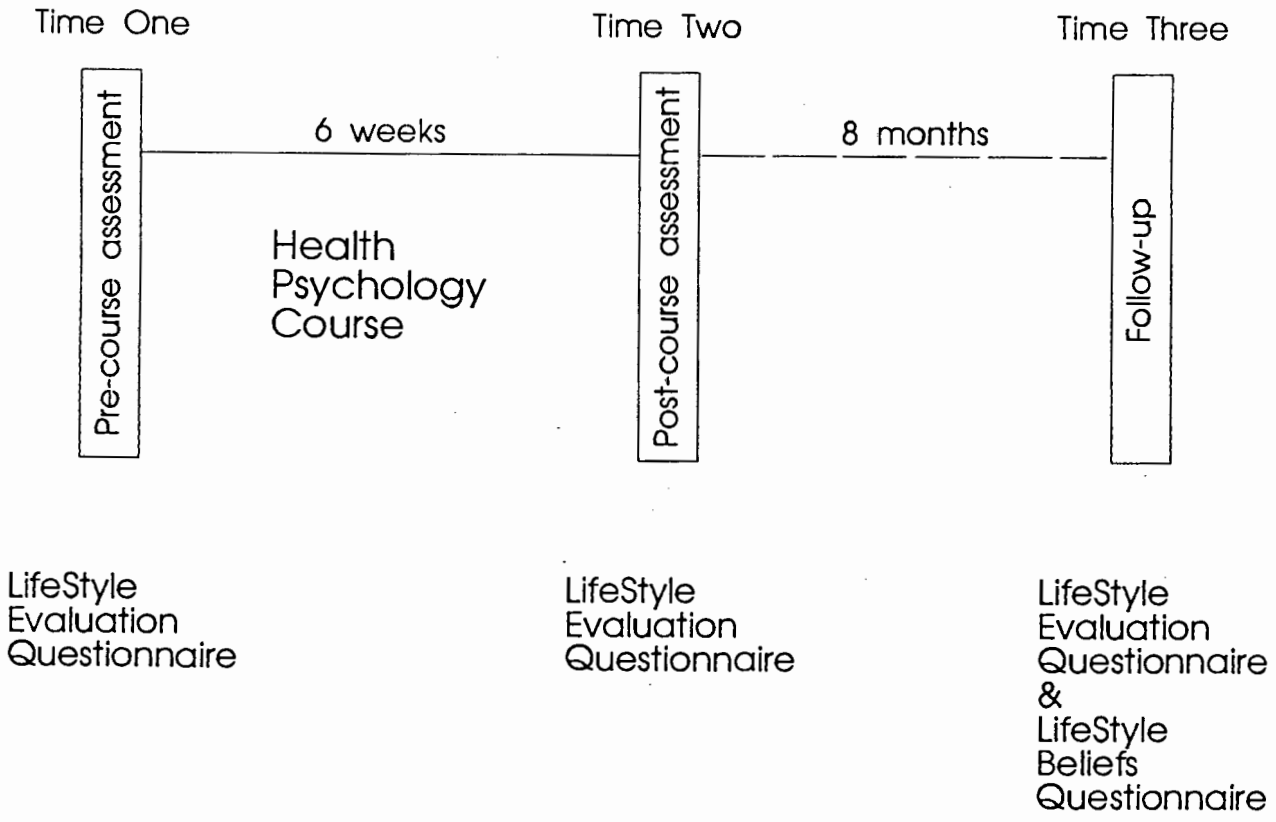

Figure 3. Design of the study

4.2 SUBJECTS

The subjects of this study were all third year psychology students at the University of Cape Town during 1991. In the second term they had elected to take a course in health psychology run by Dr Helgo Schomer, as opposed to the other option, a course in psychotherapy and counselling, that ran concurrently. 108 students completed the course (that is, they sat the course test).

4.3 MEASURES

4.3.1 Lifestyle Evaluation Questionnaire

This questionnaire (See Appendix A) is adapted from one entitled "How healthy a life do you lead?" (Wright, 1975). It is a two-part questionnaire exploring not only obvious health behaviours such as eating and exercise, but also social, intellectual, work and leisure habits in an attempt to gather a holistic picture of the individual's lifestyle. Although students completed both parts of the questionnaire, only the first section is relevant to, and analyzed in, this study. The first section comprises questions measuring four factors: food, drugs, exercise and care (See Table 1).

Table 1

Questions examining the various components of the Lifestyle Evaluation Questionnaire

LIFESTYLE FACTOR	CORRESPONDING QUESTIONNAIRE NUMBERS
FOOD	1; 2; 10; 14; 17; 22; 23; 33; 37; 41; 42; 47; 52; 55
DRUGS	3; 6; 7; 11; 16; 20; 24; 25; 29; 30; 34; 46; 51; 54; 60
EXERCISE	4; 5; 9; 13; 21; 26; 28; 36; 39; 40; 45; 48; 50; 53
CARE	8; 12; 15; 18; 19; 27; 31; 32; 35; 38; 43; 44; 49; 56; 72; 84

The reason for limiting the study to this section is because the behaviours measured by these four factors have been shown (see Chapter Two, Section 2.2) to be directly related to the morbidity and mortality rates for a variety of chronic illnesses, such as heart disease, strokes, and cancer (Matarazzo *et al.*, 1984; Winnett, King, & Altman, 1989).

Although the other four dimensions measured in the questionnaire (social, intellectual, work and leisure) are indirectly related to an individual's state of health, they are not associated with the primary risk factors for chronic illness (Winnett, King & Altman, 1989). Although stress is recognised as an important contributor to much chronic illness (Hollis, Connor, & Matarazzo, 1982), these four dimensions do not provide a direct measure of stress.

The food component examines whether individuals follow a balanced diet of healthy food, avoiding snacking, overeating, sweet and fatty foods. Daily exercise, participation in sport

and level of fitness, are the areas covered by questions in the exercise component. Drinking, smoking and drug habits are the focus of the drug component; and care explores accident prevention and physical health care such as eating slowly and medical checkups.

Most of the questions in the original questionnaire were retained; a few, however, were removed and replaced or rephrased. Those that were removed and replaced were done to make the questionnaire more relevant for a young student population. For example, question number 42 initially read "Do you plan your family's meals so as to make sure that they have a balanced diet?" and was changed to "Do you try to make sure that you have a balanced diet?". The wording of a number of questions was altered to update old fashioned and out-of-date terms and phrases. For example, "Do you tend to bolt your food?" was altered to read "Do you tend to eat your food very quickly?" and "Do you walk or jog a minimum of a mile every day?" was changed to "Do you walk or jog a minimum of a kilometre every day?". The layout style of the questionnaire was changed in order to make it easier to complete.

The adapted questionnaire was then shown to three members of the psychology department for their comments regarding question content, grammar and style. Subsequently a number of further changes were made to the questionnaire, usually altering the wording of sentences to make the meaning clearer.

4.3.2 Lifestyle Beliefs Questionnaire

Although the Health Belief Model has been used extensively in various areas of research, no standardized questionnaire exists. All previous researchers have designed their own Health Belief Model questionnaire (Janz & Becker, 1984). The questionnaire on health beliefs used in this study (See Appendix B) is based on one developed by Frewen (1991) to investigate the relationships between the Health Belief Model and compliance in weight loss and cardiac rehabilitation programmes. Her questions were changed from ones specifically asking about coronary heart disease, obesity and related risk factors, to ones enquiring more generally about factors associated with leading a healthy lifestyle.

Table 2 summarizes the Health Belief Model variables and the corresponding questions in the Lifestyle Beliefs Questionnaire designed to elicit information about subjects' beliefs regarding healthy behaviour.

Table 2

Questions examining the various components of the Health Belief Model

COMPONENT OF THE HBM	QUESTIONS EXAMININ THE COMPONENT
1. MOTIVATIONS	
CONCERN ABOUT (SALIENCE OF) HEALTH BEHAVIOURS IN GENERAL	2
WILLINGNESS TO SEEK AND ACCEPT MEDICAL DIRECTION	5, (6)*, (7)
POSITIVE HEALTH BEHAVIOURS	3
INTENTION TO LEAD A HEALTHY LIFESTYLE	4
2. SUSCEPTIBILITY AND SEVERITY (VALUE OF ILLNESS THREAT REDUCTION).	
SUSCEPTIBILITY	8, 9
VULNERABILITY TO ILLNESS IN GENERAL	10
EXTENT OF POSSIBLE BODILY HARM	11
EXTENT OF POSSIBLE ILL-HEALTH INTERFERING WITH LIFESTYLE	1
PRESENCE OF (OR PAST EXPERIENCE WITH) SYMPTOMS	1
3. BENEFITS (PROBABILITY THAT HEALTHY BEHAVIOUR WILL REDUCE THREAT)	
SAFETY OF HEALTHY BEHAVIOURS	12, 13
THE EFFICACY OF HEALTHY BEHAVIOUR TO PREVENT, DELAY OR CURE ILL-HEALTH	15, 16
4. BARRIERS (STRUCTURAL VARIABLES)	
FINANCE	17
ACCESSIBILITY	18
CONVENIENCE	19
NEED FOR NEW PATTERNS OF BEHAVIOUR	20 (14)
COMPLEXITY OF THE REQUIRED BEHAVIOUR CHANGES	21
SIDE-EFFECTS OF HEALTHY BEHAVIOUR	13
5. ATTITUDES	
SATISFACTION WITH NEW LIFESTYLE	22, (14)
6. CUE TO ACTION	28
7. ENABLING VARIABLES	
FEELING OF CONTROL OVER HEALTH PROBLEMS	16
FEELINGS OF SELF-EFFICACY	23, 24, 26
PRIOR EXPERIENCE WITH ATTEMPTS TO CHANGE TO HEALTHY BEHAVIOUR	27
SOURCE OF ADVICE AND MOTIVATION	25, 29
SOCIAL SUPPORT	30, 31

* ( ) Indirectly assesses relevant HBM component

The premises of the Health Belief Model were discussed in detail in the literature review (See Chapter Two, Section 2.8.2). The rationale for the design of the questions in the Lifestyle Beliefs Questionnaire is now outlined.

4.3.2.1 Motivations

This component of the Health Belief Model was measured by an individual's concern about healthy behaviour in general, willingness to seek and accept medical direction, positive health behaviour and intention to lead a healthy lifestyle. These questions determine how highly an individual values his/her health which is important since the effects of an individual's beliefs regarding susceptibility to a disease, and the benefits of taking action are mediated by how highly he/she values health (Berkanovic, 1976). For a more detailed discussion, see the literature review (Chapter Two, Section 2.8.4.1).

4.3.2.2 Susceptibility and severity

This component of the Lifestyle Beliefs Questionnaire is designed to examine an individual's perceived susceptibility to three major well-known chronic diseases. Familial incidence of these diseases was included as it would act as a trigger for fear of susceptibility (Frewen, 1991) and perception of susceptibility itself. Severity was assumed for this component as it was felt that most people would regard diabetes, hypertension and heart attack as severe enough illnesses to warrant prevention if possible. This factor was also examined by vulnerability to illness in general, extent of possible bodily harm, extent of ill-health interfering with social roles, and the presence of (or past experience with) symptoms. All these questions relate to the individual's susceptibility to ill-health and, as such, are likely to be associated with performing positive health behaviours.

4.3.2.3 Benefits

Perceived benefits of living a healthy lifestyle were examined through the individual's estimate of the efficacy and safety of health-related behaviours. Becker *et al.* (1972b) assessed the safety of a proposed regimen by asking respondents whether they anticipated

any further health problems as a result of their diet. For the present study similar, but broader, questions asking whether the individual believes that positive health behaviours can have negative effects - physically, socially or psychologically, were designed. Efficacy of healthy behaviour in preventing or delaying illness was also assessed as an individual must believe in the effectiveness of the various actions before he/she will undertake them (Winett, King & Altman, 1989). This link is supported by the finding of Becker *et al.* (1972b) that mothers who believed in the effectiveness of modern medicine were more compliant in administering medication to their children than those mothers who did not.

4.3.2.4 Barriers

A negative association between leading a healthy lifestyle and variables such as expense, danger, unpleasantness, inconvenience and time constraints (Janz & Becker, 1984) was established in the literature review (See Chapter Two, Section 2.8.2.4). Financial cost, accessibility and convenience are all assessed by posing general questions asking whether individuals ever experience these factors as barriers to performing healthy behaviour. The need for new patterns of behaviour, complexity of behaviour changes, and potential side effects of healthy behaviour are also associated with individuals' not complying with recommended behaviour changes (Lees & Dydon, 1988; Lau, Quadrel & Hartman, 1990; Hollis, Connor & Matarazzo, 1982).

4.3.2.5 Attitude

This component was assessed by enquiring whether individuals found it satisfying and rewarding leading a more healthy lifestyle. If individuals dislike performing certain healthy behaviours it is very unlikely that they will continue to perform them (Hollis, Connor & Matarazzo, 1982).

4.3.2.6 Cue to action

As the cue to action in this study was assumed to be the lecturer and content of the health psychology course, the students were asked whether or not they were motivated to improve their lifestyles by the course.

4.3.2.7 Enabling variables

This component of the Health Belief Model examined feelings of control and self-efficacy, prior experience with attempts to improve lifestyle, the source(s) of advice and motivation, and social support. An individual's perception of internal and/or external locus of control over his/her health was investigated. Internal locus of control is defined as the extent to which an individual believes he/she is a controlling factor in his/her lifestyle. External locus of control is defined as the extent to which factors beyond the individual's control impact on his/her lifestyle (Bandura, 1977). Although locus of control is usually not included explicitly within the Health Belief Model because it is believed to be incorporated within other elements of the model (Janz & Becker, 1984), it was felt to be an important factor which had to be explicitly included in this questionnaire.

According to Rosenstock *et al.* (1988) self-efficacy is defined as the individual's feeling of capability for carrying out lifestyle changes, as well as his/her ability to maintain the lifestyle. The importance of this factor is recognized because a great deal of confidence is usually required to modify lifelong habits (Rosenstock *et al.*, 1988). It was assessed through the questionnaire by enquiring whether individuals felt that they could maintain any lifestyle changes, whether they had successfully executed such changes in the past, and whether they had unsuccessfully attempted any changes. Prior experience with attempts at changing behaviour was also assessed as an enabling variable. Source of advice and motivation were assessed by asking what currently inspired individuals to lead a healthy lifestyle and what sources had motivated them in the past. The importance of social support in changing behaviour has been outlined in the literature review (See Chapter Two, Section 2.3). This variable was assessed indirectly by asking respondents whether the people close to them

lead healthy lifestyles, and directly by asking whether they feel supported by those people in their attempts at practising healthy behaviour.

4.3.2.8 Demographic variables

The only demographic variables considered were age and sex. As the subjects were relatively homogeneous, that is, almost exclusively young and female, these variables were not included in any analyses.

4.3.2.9 Likelihood of performing healthy behaviour

This was not assessed in the Lifestyle Beliefs Questionnaire but rather by the Lifestyle Evaluation Questionnaire which enquired about specific behaviours.

4.4 PROCEDURE

4.4.1 Assessment Time One

During the second lecture of the course (the first was a general introduction to the course covered) the students were introduced to the author (as a Masters student conducting research) by the course lecturer Dr Helgo Schomer. They were then asked to complete a questionnaire and a copy of the Lifestyle Evaluation Questionnaire was handed to every student present. These questionnaires were all completed and returned during the lecture period.

In return for their help and co-operation, all the students who completed the questionnaire were offered a personal Life Chart (See Appendix C) based on their questionnaire scores. These were explained to the students and handed out during a health psychology lecture period one week later after their completion of the questionnaire. The Life Chart illustrates graphically the eight factors measured by the Lifestyle Evaluation Questionnaire: food, drugs, exercise, care, work, social, leisure and mental. Each factor was scored out of a total of fifteen points, ten being an average score.

A total of 98 students completed this questionnaires; 82 (84%) were female students, 16 (16%) were male students and the mean age was 21.6 years.

4.4.2 Assessment Time Two

During the second last lecture slot for the Health Psychology course, the students were once again asked for their co-operation in completing the Lifestyle Evaluation Questionnaire. A copy was handed to every student present and returned before the end of class. Of the 108 students who completed the course, 94 handed in the second Lifestyle Evaluation Questionnaire: 79 (85%) were female and the mean age was 21.5 years.

4.4.3 Assessment Time Three (follow-up)

Eight months after the completion of the Health Psychology course, in May 1992, the follow-up began. Only students who had completed the Lifestyle Evaluation Questionnaire at Time One *and* at Time Two were included in the follow-up. As many students as possible were contacted telephonically to:

1) ask if they would be willing to complete further questionnaires

2) check if they still resided at the address listed on the second Lifestyle Evaluation Questionnaire they had completed.

All of those students contacted agreed to complete the questionnaires. Since many students had completed their university studies the previous year, a large proportion had moved. Most, however, had left their new phone number and address. Three students were overseas and five had left no forwarding address or new telephone at their residence. The remaining 78 subjects were mailed a third Lifestyle Evaluation Questionnaire and in addition, a copy of the Lifestyle Beliefs Questionnaire which was discussed earlier in this chapter. A covering letter was also included. They were offered another Lifestyle Chart, and a copy of the results when available, as incentives to encourage the students to return the questionnaires in the stamped self-addressed envelope that was provided.

42 (54%) of the questionnaires sent out were returned within the month and were included in the analyses. Unfortunately, many were received too late. However, 54% is a good response rate for mailed questionnaires (Lau *et al.*, 1980). 86% of those received were from women and the mean age of the whole sample was 22.2 years.

CHAPTER FIVE

RESULTS

In the previous chapter the questionnaires and procedures used to gather data for this study were outlined. In this chapter the results that were obtained are presented. A description of the statistical procedures utilised to analyse the data is first outlined and then a summary of the findings is presented.

5.1 PROCEDURE OF THE STATISTICAL ANALYSES

The procedure of the data analysis which progresses from the general to the specific is outlined in this section. Unless otherwise indicated, BMDP software was utilised to analyse data (Dixon, 1981). Firstly, changes within individuals in scores on the Lifestyle Evaluation Questionnaire (LEQ) factors of food, exercise, drugs and care were compared at Time One, Time Two, and Time Three. Only if students had completed LEQ's at Time One and Time Two are their questionnaires included in the statistical analyses of changes in responses from Time One to Time Two. All LEQ's received at Time Three were included in analysing differences between Time One and Time Three, and between Time Two and Time Three as all these students had completed both previous questionnaires.

Secondly, the responses to the single items that comprised the four LEQ factors were analysed for any statistically significant changes between Time One and Two, Time Two and Three, and Time One and Three.

The above two analyses examine Hypothesis One (that health behaviours will improve from pre-course to post-course assessment) and Hypothesis Two (that any changes in health behaviour will not be maintained from completion of the course until the follow-up).

To test the third Hypothesis (relationships between Health Belief Model components and the four LEQ factors) a correlation and regression analysis was carried out, to determine if the Lifestyle Beliefs Questionnaire (LBQ) components, namely motivation, susceptibility,

benefits, barriers, attitude, cue to action and enabling variables could predict scores of the LEQ factors of food, exercise, drugs and care. Individual questions in each of these Health Belief Model components were then compared to the individual questions that comprise the LEQ factors.

5.2 RESULTS

5.2.1 Lifestyle Evaluation Questionnaire factors over time

To compare the LEQ factors (food, exercise, drugs and care) at Time One, Two, and Three, a detailed data description was computed providing the means and standard deviations for each factor (See Appendix E). In order to test whether the differences between factors at each time are statistically significant, the scores on each factor at Time Two were subtracted from the scores of the corresponding factor at Time One. Similarly, the scores of the factors at Time Three were subtracted from those at Time One and Time Two. The means of all these differences were then obtained. T-tests were then conducted to determine if the means of the changes over the various periods for each factor are significantly different.

The results of the above analyses are now discussed.

A significant change in responses was established for exercise from Time One to Two ($t = 5.24$; $df = 84$; $p < .001$), from Time Two to Three ($t = 13.81$; $df = 41$; $p < .001$), as well as from Time One to Three ($t = 18.14$; $dr = 41$; $p < .001$). These are all positive changes in health behaviour as the amount of exercise reported increased over time.

A significant change in the number of positive (good health behaviour) responses was found for the food factor from Time One to Two ($t = 3.45$; $df = 84$; $p < .01$). However, no significant changes in food scores occurred from Time Two to Three, or from Time One to Three.

A significant change in responses to care questions occurred from Time One to Two ($t = 4.15$; $df = 84$; $p < .001$) and from Time One to Three ($t = 2.37$; $df = 41$; $p < .05$).

Once again, these changes indicate a move towards more positive health behaviour. No significant changes were obtained for the time period Two to Three.

No significant response change to the drug factor questions was obtained over time.

5.2.2 Lifestyle Evaluation Questionnaire responses to items

In order to compare the single items of the four LEQ factors at Time One, Two, and Three, two-way frequency tables (cross-tabulations) were first used to summarize the data (See Appendix F for examples). These tables were then analysed using McNemar's test of symmetry.

McNemar's test of symmetry is used when the same subjects are measured on the same categorical variable at different times. The test measures whether a change in the one direction (for example, from yes to no) is equal to a change in the other direction (from no to yes) (BMDP Statistical Software Manual, 1988). The McNemar statistic tests for change around the diagonal, rather than for independence between row and column variables, in tests using the Pearson chi-square statistic. It tests "the equality of frequencies in all pairs of cells that are symmetric around the diagonal" (BMDP Statistical Software manual, 1988, p.267).

Frequencies in the major diagonal (upper left to lower right) are ignored. In the 2 x 2 table, this reduces to a test of equality of the two off-diagonal cells. A significant value ($p < .01$) indicates lack of symmetry, that is, a greater change in one direction than the other.

Due to the large number of tables computed, the possibility of making a Type I error (that is, rejecting the null hypothesis when it is true) (Howell, 1989) became greatly inflated. For this reason only those results found to be significant at the .001 level are reported.

Although responses to thirteen questions changed significantly ($p < .05$) from Time One to Two, with the number of "no" responses to the items increasing (indicating an improvement in health behaviour), only three achieved significance at the .001 level. Questions number 7 (drugs): Do you use, even occasionally, any illegal drug such as marijuana? ($X^2 = 74$;

df = 2; $p < .0001$, McNemar Test); question number 12 (care): Do your eating habits frequently give you painful indigestion? ($X^2 = 81$; df = 3; $p < .0001$, McNemar Test); and question number 53 (exercise): Do you find yourself short of breath after climbing a flight of stairs? ($X^2 = 65.36$; df = 3; $p < .0001$, McNemar Test).

No responses to questions changed significantly ($p < .0001$) from Time One to Three or from Time Two to Three.

5.2.3 Relationships between Lifestyle Evaluation Questionnaire Factors and Lifestyle Beliefs Questionnaires Components

To determine if motivation, susceptibility, benefits, barriers, attitude, cue to action and enabling variables can predict food, exercise, drugs, and care scores as evaluated at Time Three, bivariate scatterplots (regression analyses) were computed (See Appendix G).

A significant positive correlation was determined between susceptibility and drugs ($r = .365$; $p = .018$) and between benefits and exercise ($r = .343$; $p = .026$). A significant negative correlation was obtained between benefits and drugs ($r = -.507$; $p < .001$) and between barriers and exercise ($r = -.43$; $p = .004$). Thus the benefits and barriers components can predict the extent to which those individuals exercise, whereas benefits and susceptibility scales predict drug use.

5.2.4 Relationships between LEQ and LBQ items

The responses per item for LEQ factors (food, exercise, drugs and care) at Time Three and LBQ components (motivation, susceptibility, benefits, barriers, attitude, cue to action and enabling variables) were analysed and two-way frequency tables of categorical data ("yes", "sometimes" and "no" responses) were computed (See Appendix H for examples). The Pearson chi-square test statistic for independence between rows and columns was then obtained. Once again, due to the large number of tables computed, only associations significant at the .001 level are reported.

An association was found between:

1. LEQ question number 6 (drugs): If you are a cigarette smoker do you have a morning cough? and LBQ question number 2 (motivation): Do you feel that it is important that you lead a healthy lifestyle? ($X^2 = 13.3$; df = 2; $p < .001$).

2. LEQ question number 42 (food): Do you try to make sure you have a balanced diet? and LBQ question number 3 (motivation): Do you try hard to follow a healthy lifestyle? ($X^2 = 14.6$; df = 2; $p < .001$).

3. LEQ question number 49 (care): Do you brush your teeth properly and vigorously at least twice a day? and LBQ question number 3 (motivation): Do you try hard to follow a healthy lifestyle? ($X^2 = 14.6$; df = 2; $p < .001$).

4. LEQ question number 12 (care): Do your eating habits frequently give you painful indigestion? and LBQ question number 4 (motivation): Do you feel it is advantageous to live a healthy lifestyle? ($X^2 = 13.3$; df = 1; $p < .001$).

5. LEQ question number 32 (care): Do you wear a seat belt while riding in a car? and LBQ question number 12 (benefits): Do you believe leading a healthy lifestyle can have negative effects? ($X^2 = 21.8$; df = 2; $p < .001$).

6. LEQ question number 12 (care): Do your eating habits frequently give you painful indigestion? and LBQ question number 22 (attitude): Would you find it rewarding and satisfying leading a more healthy lifestyle? ($X^2 = 19.4$; df = 2; $p < .0001$).

5.3 SUMMARY OF FINDINGS

It appears that the most useful information is obtained when the question responses on the various factors are aggregated, and not when relationships between individual items are analysed.

Regarding behaviour across time (self-reported) exercise changes significantly, improving as the study progressed. Other significant improvements in health behaviour from Time One to Two were the factors of food and care, with care also improving significantly between Time One and Three.

Benefits appear to be the most useful LBQ component in predicting LEQ factors; a positive relationship was obtained with exercise and a negative one with drugs. Susceptibility also predicts drug use, and barriers (like benefits) the extent of exercise.

The first hypothesis of the study is partially supported. The health behaviours of exercise, food and care improve from pre- to post-course assessment as predicted. However, drug use did not change significantly during this time period.

Hypothesis Two is not confirmed by the results of the study. No health behaviours (as measured by the LEQ) changed (deteriorated) significantly from post-course measurement to follow-up.

The third hypothesis is also partially supported, with the Health Belief Model variables benefits, barriers and susceptibility predicting at least one health behaviour each. However, no relationship between motivation, attitude, cue to action, or enabling variables was found with any of the health behaviours.

The implications of the above findings are discussed in the following chapter.

CHAPTER SIX

DISCUSSION

The implications of the findings presented in the previous chapter together with a critique of the study are now discussed.

Three important issues will be addressed in the course of the discussion. These include (a) the findings of the study; (b) the contribution of the HBM variables to understanding health behaviour, and (c) criticisms (where necessary) of the study.

6.1 INITIAL CHANGES IN HEALTH BEHAVIOUR

The health behaviour of the students in this study improved significantly from pre- to post-course assessment for dietary, exercise and care behaviours, thus partially supporting the first hypothesis that the health psychology course initiated such changes.

It is contended that because the health psychology course contained the elements necessary for a persuasive communication, it was responsible for initiating and maintaining these behavioural changes. As discussed in the literature review (See Section 2.6), an effective communication is presented by an expert and trustworthy source, able to capture and hold the receiver's attention while conveying an easily understood message and offering the receiver clear and realistic channels of action (Lau *et al.*, 1980). The acceptance of information from this source depends on the extent to which recipients regard that source as credible, trustworthy, knowledgeable, attractive and similar to themselves (McGuire, 1968). These factors contributed towards convincing and motivating students to make changes to their lifestyles in a direction regarded as beneficial.

Due to the non-experimental nature of the study, other factors could possibly have contributed to this improvement in behaviour. Measurement of the dependent variables relied on self-report, and one disadvantage of this method of data collection is that the person's self-reported data may be biased, inaccurate, or falsified. Another possible

disadvantage of self-report measures is that they can sometimes be reactive; that is, the self-monitoring of their behaviour by the subjects may significantly affect the behaviour in some manner (McFall, 1978). However, the health psychology course content certainly made the students aware of their current behaviour contributing to subsequent behavioural change, as eighty three percent responded to the (LEQ) cue to action question that the course motivated them to improve their health behaviours. Self-reports of behaviour are also subject to possible bias toward under-reporting of less-than-desirable behaviour. However, it has been found that self-reports of health habits predict morbidity and mortality nine years later (Mullen, Hersey & Iverson, 1987). It is also possible that the students became aware of the study's hypothesis, through the health psychology course content, and attempted to help confirm them. Other factors, such as television programmes and newspaper articles may have motivated the students to improve their health behaviour. The impact of these extraneous variables upon their behaviour is likely to be negligible, however, in comparison to the intensive exposure to a six week course.

The Health Belief Model would predict that changes in health behaviour occurred as a result of the students perceiving the benefits of a healthy lifestyle as outweighing the barriers to performing the various behaviours; with the course in health psychology acting as a powerful cue to action. It is well documented that a large proportion of interventions containing persuasive elements initially exhibit favourable improvements in the health behaviour of their subjects (Davidson & Davidson, 1980).

Most health behaviour studies occur over extended time periods to allow for behavioural change to take place, and are thus usually subject to the aforementioned problems in determining whether relationships exist between the variables. This limitation is also a strength in that, in reality, extraneous variables do influence people in altering their behaviour, so the outcome of a field study is quite likely to mirror reality.

Possible explanations for no significant behavioural changes on the Drug factor will be discussed later in this chapter.

6.2 CHANGES IN HEALTH BEHAVIOUR FROM POST-COURSE TO FOLLOW-UP ASSESSMENT

Contrary to the second hypothesis, self-reported exercise improved significantly from post-course to follow-up assessment. No significant changes in either direction occurred for the other health behaviours measured.

It was hypothesised, based on the literature, that any improvement in exercise would be subject to relapse. Usually more than half of the individuals embarking on an exercise programmer will either abandon it entirely or only continue to exercise irregularly with most dropouts occurring during the first three months (Beslisle, Roskies & Levesque, 1980).

A fairly likely explanation for the observed phenomenon is that the post-course assessment occurred in winter and the follow-up in summer. It has been found that people exercise more in summer than in winter (Keir & Lauzon, 1980; Mullen, Hersey & Iverson, 1987). This seasonal increase in exercise behaviour may occur because opportunities for exercise improve in summer. For example, it is more pleasant to go jogging on a warm, sunny, spring day, than on a wet, cold, winter's day. In addition, as students don swimming costumes or shorts and head for the beach, there is strong social and peer pressure to look good, and exercise is the best way to achieve and maintain a trim figure (Keir & Lauzon, 1980). It is likely then, that the health psychology course initiated an increase in exercise behaviour, which was aided by the arrival of summer.

It is also possible that the income of the subjects in the study may have increased since the majority of them had completed their university studies. Thus they might have been able to afford the expense of joining the increasingly popular health clubs or fitness programmes, if this way of exercising appealed to them.

It was noted in the literature review that people who practice one health behaviour do not always practice others (Harris & Guren, 1979; Krick & Sobal, 1990). In addition, there is evidence that programmes are more effective when they ask for changes of behaviours in

several areas, possibly because this permits greater opportunity for individual commitment to change that is personally meaningful (Meyer & Henderson, 1974). For a student population, exercise is quite possibly viewed by them as a desirable behaviour with obvious benefits such as a trimmer figure and increased fitness, as well as the fact that it can be very sociable and thus easier to maintain over time.

It is also possible that as the individual embarks on an exercise programme and begins to notice positive changes, the process may become "addictive" and further change instituted (Milsum, 1980). Exercise also improves mood since exercise induced adrenal secretions stimulate the pleasure centre in the hypothalamus, producing distinct enjoyment (Cormier, Prefontaine, McDonald & Stuart, 1980; Keir & Lauzon, 1980). It may also decrease or sublimate tension and aggression which may influence long-term compliance to exercise programmes (Keir & Lauzon, 1980).

A possible reason why dietary changes did not also significantly continue to improve may be because eating patterns are extraordinarily difficult conditions to correct and are markedly resistant to long-term modification (Schacther, 1982). To the extent that the behaviour has been used as a means of dealing with stress in the past, relapse into old behaviour patterns is very likely (Marlatt & Gordon, 1980), and when major shifts in daily habit patterns occur rapidly, frustration and feelings of deprivation are typical and often a slip back into old behaviours patterns occurs (Hunt & Matarazzo, 1973). Maintaining changes in eating habits requires old habits to be broken and complex changes to occur (Davidson & Davidson, 1980), which makes relapse all the more likely. Individuals are also least likely to perform behaviours that require effort and more likely to perform behaviours that are viewed as requiring little effort (Turk, Rudy & Salovey, 1984).

6.3 LONG-TERM HEALTH BEHAVIOUR CHANGES

Improvements in care and exercise behaviour were detected from pre-course assessment to follow-up. It appears that these behaviours improved steadily with the passage of time. Possible explanations for exercise behaviour change were discussed in the previous section.

The most likely explanation for the improvement in care behaviour is that this dimension, as measured by the LEQ, appears to involve behaviours that are easier to change than more resistant ones such as dietary preferences and smoking. The care factor assessed behaviours such as those preventing accidents (for example, wearing a seat belt in a car, not drinking and driving), and general physical health care such as regular medical checkups, sufficient rest, and looking after one's body. In general, they do not require breaking long-term habits that are resistant to change.

Once again though, improvement in scores on this dimension could be related to the fact that most of the subjects were now employed, and perhaps had taken on more responsibility in their new roles.

The one LEQ factor for which no significant changes were documented was the drug factor. This covered smoking, drugs and drinking behaviours as well as the use of painkillers and prescription medicines. The most likely reason for no observed changes was the fact that at the outset very few students included in the study smoked, very few took illegal drugs and only a small number drank excessively. Because most already practised the positive health behaviours measured by this factor, the potential for change in the group was very small. Hence, there was very little room for improvement.

In addition, it is likely that there would be strong peer group pressure to continue these behaviours. Numerous authors have noted that smoking is an addictive habit maintained by a variety of factors, including the physiological effects of nicotine, social reinforcement and anxiety reduction (Henderson, Hall, & Lipton, 1980). Physiologically addictive habits have notoriously high recidivism rates with about two-thirds of all relapses occurring within the first ninety days following cessation (Marlatt & Gordon, 1980). While the affects of physical addiction cannot be discounted, Marlatt & Gordon (1980) contend that there are common behavioural and cognitive components associated with relapse. The result of their analyses revealed that over 50% of all relapse situations fell into two categories:

1. situations in which the individual was frustrated or angered, usually in a social situation;

2. situations in which the individual was confronted by social pressure.

This highlights the salience of social factors as determinants of relapse.

There is strong evidence that social networks are crucially important in shaping an individual's beliefs and behaviour (Berkanovic, 1976). According to Berkanovic (1976) social networks are an important source of restraint with respect to the behaviours that an individual finds acceptable. Groups enforce norms of behaviour among their constituent members. Where these norms conflict with behaviours advocated by a change agent, it is unlikely that individuals will risk violating the established relationships by modifying their behaviour in the manner desired by a change agent.

6.4 HEALTH BELIEF MODEL COMPONENTS AS PREDICTORS OF BEHAVIOUR

6.4.1 Benefits

This component of the Health Belief Model was significantly positively correlated with exercise behaviour and negatively associated with the drug factor. Janz & Becker's (1984) review of HBM studies indicated that benefits were the second strongest predictor of health behaviour, the strongest being the barriers dimension. It is probable that the correlation between benefits and exercise is not due to the belief that exercise reduces susceptibility to a number of chronic illnesses, but that exercise has many other benefits independent of the health consequences of such behaviour (Berkanovic, 1976). The advantages of exercise as perceived by a young population are likely to be weight loss, a trimmer figure, and psychological benefits (Milsum, 1980).

Keir & Lauzon (1980) advocate a number of principles to be incorporated into strategies to encourage a greater personal commitment to increase physical activity:

1. Planned behaviour change is best applied in a group setting. The opportunity for social interaction greatly increases the success of programmes.

2. Learning new behaviours must be made pleasurable if the unlearning of old behaviours is to take place. If it is enjoyed it is more likely to be maintained.

3. People learn from each other and model their behaviour after those they most admire. Role models are a positive reinforcer of behaviour.

4. Change is facilitated when the advocated measures are both available and accessible. Some type of activity is readily available to most individuals.

5. Evaluation for a new behaviour must emphasise the new gains rather then what is lost. Programmes usually promote the physiological and psychological benefits associated with exercise.

These strategies to increase exercise behaviour were discussed in the health psychology course. Exercise was especially promoted as being fun, sociable, easily available and highly beneficial. Restricting dietary intake, however, is more difficult to conceptualise as being "fun". It is usually seen as a deprivation of enjoyable behaviour.

A number of studies have found the benefits dimension to be the most powerful predictor of health behaviour (Janz & Becker, 1984). A comparison of various explanatory models of health behaviour by Mullen, Hersey & Iverson (1987) revealed that the HBM was the best predictor of exercise behaviour, which explains why both the benefits and barriers dimension predicted exercise behaviour in this study.

The finding that as the perceived benefits of a healthy lifestyle increase, drug use decreases can be explained. Those people who firmly believe in the benefits of healthy behaviour, are unlikely to perform unhealthy behaviours, such as smoking, drinking, using drugs and taking unnecessary medication.

6.4.2 Barriers

The barriers component of the HBM predicted exercise behaviour. As the perceived barriers to leading a healthy lifestyle increased, so exercise decreased. As noted earlier, in the Janz & Becker (1984) review barriers were the strongest predictor of health behaviour performance. Interestingly, subjects in this study did not perceive barriers as relating to eating habits. It is possible that the barrier questions in the LBQ were phrased in such a way that subjects immediately thought of exercise rather than dietary factors.

6.4.3 Susceptibility

The susceptibility component of the HBM was significantly positively correlated with drug use. That is, those who perceived themselves as highly susceptible to the listed illnesses had higher drug scores (more smoking, drinking and drug usage) than those who perceived themselves as less susceptible to those illnesses. One would speculate that in terms of understanding the motivation of susceptibility, the reverse should be true; that if individuals feel susceptible to chronic illnesses such as heart disease, they would take the necessary preventive steps, such as refraining from poor health habits like smoking.

The most likely explanation for this association is that individuals who felt susceptible to illness felt that way *because* of their poor health habits such as smoking and drinking. It is also possible these individuals do not believe that there is anything they can do to prevent these illnesses, so they accept the inevitable and make the most of life (by drinking and smoking) while they can. That is, they have an external locus of control, which is associated with not taking the necessary preventative actions (Winnett, King & Altman, 1989).

6.4.4 Motivation

This component of the HBM did not significantly predict any of the measured health behaviours. A number of studies have also found this to be the case. The review by Janz & Becker (1984) and Frewen's (1991) study found that motivation contributed significantly to

understanding preventive health behaviour only in conjunction with other HBM variables, and not as a separate variable.

The findings of this study confirm that this component is not successful as a separate variable for understanding health behaviour. A possible explanation may be that the information examined in this study related to general health motivation rather than more specifically what motivated the students to perform individual aspects of health behaviour, such as exercise, eating and smoking, among others.

6.4.5 Other HBM Components

None of the remaining HBM components, namely attitude, cue to action and enabling factors predicted the performance of any health behaviour. Demographic variables were not analysed for reasons stated in the results chapter.

It is interesting to note, as mentioned earlier, that eighty-three percent of respondents stated for the cue to action question that the health psychology course did motivate them to improve their health behaviours, which is further evidence for the contention that the healthy psychology course, rather than other factors, contributed to the improvements in health behaviour.

6.4.6 Summary of HBM Components

Hypothesis Three was partially supported by the study. Some HBM components correlated significantly with two health behaviours: exercise and drug use. The three most predictive components of preventive health behaviour found by Janz & Becker (1984) were the same as the three components found to significantly predict some health behaviours in this study. These components are benefits, barriers and susceptibility. The benefits dimension predicted exercise and drug use, barriers predicted exercise, and susceptibility predicted drug use.

According to Janz & Becker (1984), the HBM may lack the ability to explain habitual health behaviour, such as eating habits which might explain why no HBM dimensions could significantly predict scores on the food factor.

There are always many links in the chain between an intervention and outcome (Kaplan, 1984) and we have managed to isolate a few: the beliefs that might help explain behaviour. Thus the HBM provided some clarification of how individual's perceive living a healthy lifestyle.

In conclusion we may say that although a relationship may exist between various HBM components and various health behaviours, we cannot establish whether beliefs determine behaviour or whether behaviour influences beliefs. This is a limitation of the study which might have been partially avoided in a prospective research design. Further limitations of the study will now be discussed.

6.5 LIMITATIONS OF THE STUDY

Some limitations have been discussed earlier in this chapter and these will not be repeated here.

A criticism against the study might be that the course in health psychology was not aimed at directly changing behaviour although students were often encouraged to attempt various behaviours and strategies. The fact that behavioural change did occur though, provides support for the contention that, whether intended or not, the course contributed to these changes. One knows that studies in psychology often have unintended outcomes.

It is not known whether students whose responses were included in the analyses attended all the lectures and thus were possibly assessed for the impact of a course upon their behaviour, which they did not attend. One can only surmise that since the lectures were consistently well attended (90 - 100 students usually), that most students received the majority of lectures. It is not known though, whether those who might consistently have chosen not to attend lectures exhibited less behaviour change, or whether it was possible to distinguish

between those who attended and those who did not, upon the basis of behaviour change. In addition, a further threat to the validity of the study is attrition. Were there any significant differences, in terms of health behaviour, between those subjects who returned their questionnaires at follow-up, and those who did not return them?

Another limitation concerns the subjects included in the study. Because they were a self-selected sample, it is possible that generalisability is limited to people who have a concern about health, and are therefore more likely to be willing to change behaviour after receiving a health message. Health campaigns are usually received most favourably by those who "need" them least as far as the "healthiness of their own habits are concerned" (Eiser & Gentle, 1989, p.118).

This study only viewed a limited number of the many health behaviours people perform. For instance, sexual behaviour and stress and relaxation were not included so a holistic picture of health was not really obtained. The reasons for the exclusion of these behaviours as documented in the methodology chapter, were that, with the exception of sexual behavior as a risk factor for contracting HIV (the precursor of AIDS), other behaviors are not directly responsible for the major chronic diseases of society today.

Since the relationship between beliefs and behaviours is a complex one (Lau, Kane, Berry, Wave, & Roy, 1980), the HBM is limited in accounting for all health behaviours. There are many reasons, independent of the HBM, that can induce the individual to try new behaviours (Berkanovic, 1976). Non-health related factors enter into individual decision-making with respect to smoking, eating, drinking and exercise behaviours, and these factors may either reinforce or contradict the decision indicated by the beliefs specified in the model.

6.6 CONCLUSION

Behavioural change often occurs when some formerly routine activity is brought into consciousness for a prolonged period of time such that it becomes salient or problematic. The actions associated with a former habit become subject to cognitive appraisal, putting the individual in a situation where information which was previously filtered out now impinges on perceptual processes. The presence and interest of significant others provides both reinforcement and helps keep the behaviour in question salient (Hunt & Martin, 1988). A persuasive communication provides additional impetus in motivating the behavioural changes. Additionally, strategies which utilise naturally occurring cognitive and social phenomena to encourage self-initiated change are likely to be more efficacious (Hunt & Martin, 1988).

In essence, the above description of an ideal situation for motivating individuals to change their behaviour, explains why attending the health psychology course was associated with health behaviour changes for numerous students.

Attending the course was associated with initial behaviour changes in the areas of exercise, food and care, and maintenance of exercise behaviour over time. The Health Belief Model can be drawn upon to provide explanations of health behaviours.

Exercise behaviour was predicted in this study by the HBM dimensions of benefits and barriers, and drug use was predicted by the benefits and susceptibility components. Other health behaviours measured in the study were not predicted by the model which has, like all models, limitations to the amount of variance in behaviour that can be explained. Beliefs are not the only factors that determine behaviour.

This study confirms previous research on health behaviour. It provides an idea of what components might be necessary in trying to initiate health behavioural change amongst young, healthy individuals. It also provides theoretical support for the Health Belief Model in terms of accounting for, and predicting, health behaviour.

It is encouraging to see that university education can go beyond the dissemination of knowledge. The students in this study received the knowledge, translated it into their own lives and acted upon it. In future, it may be worthwhile investigating whether a practical course could provide further incentive for behavioural change.

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APPENDIX A

LIFESTYLE EVALUATION QUESTIONNAIRE

All information contained in this questionnaire is strictly confidential.

Name: _____

Address: _____

_____

_____

Phone No. _____

Sex: **Male** ☐ **Female** ☐

Age: _____

Please indicate whether you wish to receive the following:

Lifestyle Chart		**Report**	
Yes	☐	**Yes**	☐
No	☐	**No**	☐

Please read and answer the following statements as honestly as possible.

Circle the answer that is most applicable to you.

			Office Use Only	
1.	Do you take sugar in your coffee or tea?	Y / N	1.	☐
2.	Do you take more than two spoonfuls?	Y / N	2.	☐
3.	Do you regularly take aspirin and non-prescription painkillers more than once a week? (Women exclude painkillers for period pains).	Y / N	3.	☐
4.	Do you play, on a regular basis (more than twice a month), any active competitive sport such as Tennis, squash, football (but not including golf)?	Y / N	4.	☐
5.	If yes, do you play more than once a week?	Y / N	5.	☐
6.	If you are a cigarette smoker do you have a morning cough? (Non-smokers score "No").	Y / N	6.	☐
7.	Do you use, even occassionally, any illegal drug such as marijuana?	Y / N	7.	☐
8.	Do you tend to eat your food very quickly?	Y / N	8.	☐
9.	Do you walk or jog a minimum of a kilometre every day? (Inclúde golf but not walking around the house or university).	Y / N	9.	☐
10.	Do you drink (including tea and coffee) at least two litres of fluid a day?	Y / N	10.	☐
11.	When suffering from relatively minor illnesses and infections, do you go to the doctor for antibiotics or other medication as a matter of course rather than try to "ride it out"?	Y / N	11.	☐
12.	Do your eating habits frequently give you painful indigestion?	Y / N	12.	☐
13.	If you own a bicycle, do you use it whenever you can? (If you have no bicycle, score No).	Y / N	13.	☐
14.	Do you find yourself frequently nibbling snacks or chocolates between meals?	Y / N	14.	☐
15.	Are you careful when using potentially harmful products or substances (such as poisons or electrical devices)?	Y / N	15.	☐
16.	Do you have to use pills of any kind to help you sleep?	Y / N	16.	☐
17.	Does your diet include regular helpings of salads and fresh vegetables?	Y / N	17.	☐

			Office Use Only	
18.	Do you visit your doctor and dentist for checkups annually?	Y / N	18.	☐
19.	Do you tend to skip meals because you are"busy" and then fill up on snacks?	Y / N	19.	☐
20.	Do you avoid driving while under the influence of alcohol and other drugs?	Y / N	20.	☐
21.	Do you feel that you could, with just a little practice, take up a really strenuous sport such as mountaineering, long distance running or competitive swimming? (Score Yesif you already do so).	Y / N	21.	☐
22.	When eating out at restaurants or with friends do you frequently end up feeling rather overfull?	Y / N	22.	☐
23.	Do you tend to have a definite weakness for sweet, sticky foods?	Y / N	23.	☐
24.	Do you smoke?	Y / N	24.	☐
25.	Do you regularly smoke more than a pack a day or its equivalent in pipe tobacco?	Y / N	25.	☐
26.	Do you do regular daily exercises (including exercise machines at home)?	Y / N	26.	☐
27.	If you stand in front of a mirror without clothes on, do you notice definite areas of excess fat?	Y / N	27.	☐
28.	Do you find it a real strain to carry bags or heavy parcels upstairs?	Y / N	28.	☐
29.	Do you avoid drinking alcoholic beverages or do you drink no more than 1-2 drinks a day?	Y / N	29.	☐
30.	Do you ever drink enough alcohol to give you unpleasant side effects of any kind (eg. a hangover)?	Y / N	30.	☐
31.	Do you tend to keep very late hours, even when you feel physically tired and fatigued?	Y / N	31.	☐
32.	Do you wear a seatbelt while riding in a car?	Y / N	32.	☐
33.	Do you have fresh fruit or fruit juice at least once a day?	Y / N	33.	☐
34.	Do you regularly use tranquilisers or anti-depressant drugs as prescribed by your doctor?	Y / N	34.	☐

			Office Use Only	
35.	Do people tend to comment spontaneously on "how well you look"?	Y / N	35.	☐
36.	Do you swim regularly (say at least twice a week in the summer months, or at other times when you have the opportunity)?	Y / N	36.	☐
37.	Do you avoide, wherever possible, fatty foods such as French fries?	Y / N	37.	☐
38.	If you are a smoker, do you feel uneasy if you do not have cigarettes always to hand or if you find yourself in a place where you cannot smoke? (Non-smokers score No).	Y / N	38.	☐
39.	If you take regular exercise, have you been doing so for at least the last two years?	Y / N	39.	☐
40.	Do you allow clothing styles or fashions to interfere with your physical comfort significantly - for example, uncomfortable shoes or clothing unsuitable for the weather?	Y / N	40.	☐
41.	Do you regularly eat more than two cooked meals in the day?	Y / N	41.	☐
42.	Do you try to make sure that you have a balanced diet?	Y / N	42.	☐
43.	Is your weight within five kilograms of that recommended for your build? (If you don't know, score No).	Y / N	43.	☐
44.	Do you smoke in bed? (Non-smokers score "No").	Y / N	44.	☐
45.	Do you find yourself taking a car for short journeys when you could just as easily walk?	Y / N	45.	☐
46.	Do you receive prescription medicines on a regular basis from your doctor?	Y / N	46.	☐
47.	Do you spread butter liberally on toast or bread?	Y / N	47.	☐
48.	Would you honestly describe yourself as a physically lazy person?	Y / N	48.	☐
49.	Do you brush your teeth properly and vigorously at least twice a day?	Y / N	49.	☐

			Office Use Only	
50.	Do you walk or jog over three kilometres regularly each day? (Include golf, but not walking around the house or university).	Y / N	50.	☐
51.	Do you regularly take alcohol (even a glass of beer) at lunchtime?	Y / N	51.	☐
52.	Do you tend to eat out more than you eat at home?	Y / N	52.	☐
53.	Do you find yourself short of breath after climbing a flight of stairs?	Y / N	53.	☐
54.	Has anyone every said to you that you smoke too much? (Non-smokers score No).	Y / N	54.	☐
55.	When potato crisps, salted nuts and cocktail savouries are around, do you find them impossible to resist?	Y / N	55.	☐
56.	Would you say that on the whole your lifestyle leads you to abuse or ill-treat your body?	Y / N	56.	☐
57.	Are you taking a part-time study or self-improvement course? (Besides your normal university courses).	Y / N	57.	☐
58.	Would you describe your childhood as having been a happy one?	Y / N	58.	☐
59.	Do you feel that your personality has evolved and matured in a satisfactory way since you left school?	Y / N	59.	☐
60.	Do you use alcohol or other drugs as a way of handling stressful situations or problems in your life?	Y / N	60.	☐
61.	Do you find it difficult to introduce yourself to people and converse with them?	Y / N	61.	☐
62.	Are you a good letter writer?	Y / N	62.	☐
63.	Do you find your studies really enjoyable?	Y / N	63.	☐
64.	Do you watch television on average for less than two hours a day (say 15 hours a week)?	Y / N	64.	☐
65.	Do you tend to jump from one hobby or past-time to another without ever getting deeply into one?	Y / N	65.	☐
66.	Do you have any unusual fears or phobias?	Y / N	66.	☐

			Office Use Only	
67.	Would you honestly say that your studies give you the challenge and opportunity which you deserve?	Y / N	67.	☐
68.	Would you say that you lead an active social life?	Y / N	68.	☐
69.	Have you got any domestic hobbies of a practical kind, for example, woodwork, dressmaking, decorating or handicraft of any kind?	Y / N	69.	☐
70.	Do you have any domestic hobbies of a creative but not necessarily practical kind, eg. painting, stamp/coin collecting, modelling, embroidery?	Y / N	70.	☐
71.	Do you feel happy and confident most days?	Y / N	71.	☐
72.	Do you read and follow the label directions when using prescribed and over-the-counter drugs?	Y / N	72.	☐
73.	Do you have trouble sleeping?	Y / N	73.	☐
74.	Are you married? If not, do you have a lover or fiance?	Y / N	74.	☐
75.	If so, would you describe your relationship with this person as a happy one?	Y / N	75.	☐
76.	If you could give up your present life for something more interesting, would you gladly do so?	Y / N	76.	☐
77.	Do you make a point of taking at least one holiday per year when you are two weeks away from your work and usual surroundings?	Y / N	77.	☐
78.	Do you always seem to be in financial difficulties?	Y / N	78.	☐
79.	Do financial problems worry you unduly?	Y / N	79.	☐
80.	Do you tend to push yourself harder than most other people around you at university?	Y / N	80.	☐
81.	Do you make friends easily?	Y / N	81.	☐
82.	Do you tend to find yourself bored and restless when not working?	Y / N	82.	☐
83.	Have you ever had a nervous breakdown or been treated for severe depression?	Y / N	83.	☐
84.	Do you generally obey traffic rules when driving?	Y / N	84.	☐

			Office Use Only	
85.	Would you prefer an evening watching television or reading to an evening out with friends?	Y / N	85.	☐
86.	Would you describe yourself as basically quite a happy person?	Y / N	86.	☐
87.	Do you enjoy any practical mechanical hobbies of any kind?	Y / N	87.	☐
88.	Do you regularly read books (other than magazines and newspapers)?	Y / N	88.	☐
89.	If so, would you say that you really enjoy reading?	Y / N	89.	☐
90.	Do you wish that your sex life was fuller and happier?	Y / N	90.	☐
91.	Do you sometimes feel that everything is getting to be too much for you?	Y / N	91.	☐
92.	Would you say that most people think of you as a sociable person?	Y / N	92.	☐
93.	Do you feel that other people have seriously handicapped you as far as your job or profession is concerned?	Y / N	93.	☐
94.	Do you enjoy cooking occassionally?	Y / N	94.	☐
95.	Do you enjoy going out to dinner with friends?	Y / N	95.	☐
96.	Do you regret having missed out on any educational opportunities?	Y / N	96.	☐
97.	If you could begin your university studies over, would you choose a different career?	Y / N	97.	☐
98.	Do you get unnecessarily anxious and worried about things?	Y / N	98.	☐
99.	On balance, are you content to do things on your own and be one your own if necessary?	Y / N	99.	☐
100.	Have you more than one close friend whose company you really enjoy?	Y / N	100.	☐
101.	Do you enjoy actively listening to music?	Y / N	101.	☐
102.	Have you made steady progress and advancement in your university career?	Y / N	102.	☐

			Office Use Only	
03.	Do you find it difficult to switch off and relax at the end of the day?	Y / N	103.	☐
04.	Do you have any outdoor hobbies or past-times, such as playing sports or watching them?	Y / N	104.	☐
.05.	Do you enjoy parties?	Y / N	105.	☐
.06.	Would you describe yourself as sexually attractive?	Y / N	106.	☐
107.	Do you feel that people or circumstances have prevented you from fulfilling yourself in the way that you would have liked?	Y / N	107.	☐
108.	Do you get irritable or short-tempered for no good reason rather more than you would like?	Y / N	108.	☐
109.	Do you watch television regularly for more than four hours a day, or say 25 hours a week?	Y / N	109.	☐
110.	Does untidiness and carelessness at work or home trouble you unduly?	Y / N	110.	☐
111.	Do you really enjoy sometimes just "loafing around doing nothing"?	Y / N	111.	☐
112.	Have you always got friends or relations who will be glad to have you visit them on vacation?	Y / N	112.	☐

APPENDIX B

LIFESTYLE BELIEFS QUESTIONNAIRE

This questionnaire enquires about your lifestyle behaviours and general health. The phrase "healthy lifestyle" is often used, which refers to:

* regular exercise
* sufficient sleep
* eating sensibly and healthily
* maintaining your optimal weight
* refraining from smoking, drugs and excessive drinking
* dealing effectively with stress

Name: _____

Office Use Only

1. Are you currently experiencing a health problem?

Yes ☐ Sometimes ☐ No ☐ 1. ☐

If yes, please elaborate .....

.....

.....

For how long have you had this problem?

Years ..... Months ..... ☐ ☐

Does it prevent you from leading a healthy lifestyle in any way?

Yes ☐ Sometimes ☐ No ☐ 1. ☐

If yes, please elaborate .....

.....

.....

.....

Office Use Only

2. Do you feel that it is important that you lead a healthy lifestyle?

Yes ☐ Sometimes ☐ No ☐ 2. ☐

3. Do you try hard to follow such a lifestyle?

Yes ☐ Sometimes ☐ No ☐ 3. ☐

4. Do you feel that it is advantageous to live such a life?

Yes ☐ Sometimes ☐ No ☐ 4. ☐

5. If you consult a doctor do you usually follow his/her advice?

Yes ☐ Sometimes ☐ No ☐ 5. ☐

6. Do doctors generally assist you in overcoming illnesses?

Yes ☐ Sometimes ☐ No ☐ 6. ☐

7. Would you rather seek alternative medical therapy, such as homeopathy, naturopathy, reflexology or acupuncture, when ill?

Yes ☐ Sometimes ☐ No ☐ 7. ☐

8. Have your parents, grandparents, or close relatives ever experienced the following illnesses?

Diabetes

Yes ☐ Don't know ☐ No ☐ 8. ☐

Hypertension

Yes ☐ Don't know ☐ No ☐ 8. ☐

Heart attack

Yes ☐ Don't know ☐ No ☐ 8. ☐

Office Use Only

9. Do you think that you would be likely to suffer from any of the following illnesses in the future?

Diabetes

Yes ☐ Maybe ☐ No ☐ 9. ☐

Hypertension

Yes ☐ Maybe ☐ No ☐ 9. ☐

Heart attack

Yes ☐ Maybe ☐ No ☐ 9. ☐

10. Do you feel that you are more susceptible to illness in general than other people?

Yes ☐ Sometimes ☐ No ☐ 10. ☐

11. Do you believe you are abusing your body if you lead an unhealthy lifestyle?

Yes ☐ Sometimes ☐ No ☐ 11. ☐

12. Do you believe that leading a healthy lifestyle can have negative effects - either physically, socially or psychologically?

Yes ☐ Sometimes ☐ No ☐ 12. ☐

13. Have you ever experienced any health problems/symptoms as a result of any healthy behaviour?

Yes ☐ Sometimes ☐ No ☐ 13. ☐

14. Are you satisfied with your present health behaviour?

Yes ☐ Sometimes ☐ No ☐ 14. ☐

15. Do you feel that it is sufficient to prevent future health problems?

Yes ☐ Maybe ☐ No ☐ 15. ☐

Office Use Only

16. Do you believe that by leading a healthy lifestyle future health problems could be prevented?

Yes ☐ Maybe ☐ No ☐ 16. ☐

17. Does lack of money prevent you from leading a healthy lifestyle? (Expensive food/shoes/equipment/classes etc)

Yes ☐ Sometimes ☐ No ☐ 17. ☐

18. Has lack of accessibility to venues/classes ever prevented you from performing healthy lifestyle behaviours?

Yes ☐ Sometimes ☐ No ☐ 18. ☐

19. Have you ever found that leading a healthy lifestyle is often inconvenient? (Awkward class times, making own food, etc.).

Yes ☐ Sometimes ☐ No ☐ 19. ☐

20. Do you think that you would have to radically alter your health behaviour in order to lead a more healthy lifestyle?

Yes ☐ Maybe ☐ No ☐ 20. ☐

21. Do you find it difficult and demanding to follow a healthy lifestyle?

Yes ☐ Sometimes ☐ No ☐ 21. ☐

22. Would you find it rewarding and satisfying leading a more healthy lifestyle?

Yes ☐ Sometimes ☐ No ☐ 22. ☐

23. Have you ever found that you set yourself un-realistically high standards of healthy behaviour, resulting in failure to improve your lifestyle?

Yes ☐ Sometimes ☐ No ☐ 23. ☐

Office Use Only

24. Do you feel confident that you could maintain a healthy lifestyle?

Yes ☐ Sometimes ☐ No ☐ 24. ☐

25. Do any of the following currently inspire you to lead a healthy lifestyle?

Nothing does

Yes ☐ Sometimes ☐ No ☐ 25. ☐

Self-motivation

Yes ☐ Sometimes ☐ No ☐ 25. ☐

Doctor/health professionals

Yes ☐ Sometimes ☐ No ☐ 25. ☐

Media

Yes ☐ Sometimes ☐ No ☐ 25. ☐

Friends

Yes ☐ Sometimes ☐ No ☐ 25. ☐

Family

Yes ☐ Sometimes ☐ No ☐ 25. ☐

Significant other (spouse, boy-/girlfriend)

Yes ☐ Sometimes ☐ No ☐ 25. ☐

26. Do you feel that you have coped well when making a change in your lifestyle in the past?

Yes ☐ Not Sure ☐ No ☐ 26. ☐

27. Before attending the Health Psychology AUC course, had you ever tried to improve your lifestyle?

Yes ☐ Sometimes ☐ No ☐ 27. ☐

Office Use Only

28. Did the Health Psychology lectures motivate you to improve your lifestyle?

Yes ☐ Sometimes ☐ No ☐ 28. ☐

29. Have other sources motivated you in the past?

Nothing

Yes ☐ Sometimes ☐ No ☐ 29. ☐

Self-motivation

Yes ☐ Sometimes ☐ No ☐ 29. ☐

Doctor/health professional

Yes ☐ Sometimes ☐ No ☐ 29. ☐

Media

Yes ☐ Sometimes ☐ No ☐ 29. ☐

Friends

Yes ☐ Sometimes ☐ No ☐ 29. ☐

Family

Yes ☐ Sometimes ☐ No ☐ 29. ☐

Significant other

Yes ☐ Sometimes ☐ No ☐ 29. ☐

30. Do the following people, in your opinion, lead healthy lifestyles?

Spouse/Significant other

Yes ☐ Sometimes ☐ No ☐ 30. ☐

Parents

Yes ☐ Sometimes ☐ No ☐ 30. ☐

Office Use Only

Siblings

Yes ☐ Sometimes ☐ No ☐ 30. ☐

Friends

Yes ☐ Sometimes ☐ No ☐ 30. ☐

Business Colleagues

Yes ☐ Sometimes ☐ No ☐ 30. ☐

31. **Do you feel supported by others in your efforts to lead a healthy lifestyle?**

Yes ☐ Sometimes ☐ No ☐ 30. ☐

Any comments about this questionnaire

_____

_____

_____

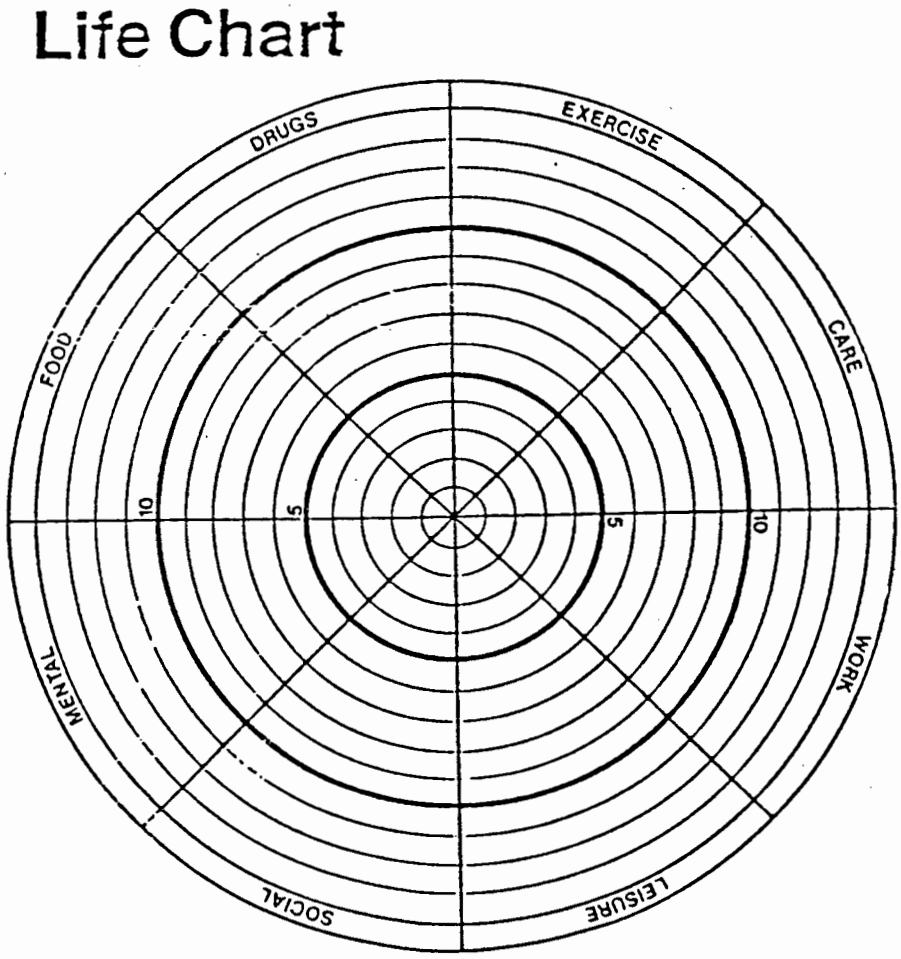
_____

_____

Thank you very much for your time and co-operation in completing this questionnaire.

APPENDIX C

LIFE CHART



APPENDIX D

COVERING LETTER SENT OUT WITH QUESTIONNAIRES AT TIME THREE

26 May 1992

Dear

Please find enclosed two questionnaires (Lifestyle Beliefs, Lifestyle Evaluation Questionnaire) and a stamped, addressed envelope.

During the Health Psychology Module of Psychology III last year you participated in a research project by answering two questionnaires about your lifestyle. Your responses so far have proven invaluable. Now, for the final phase of my project, I am asking for your co-operation once again.

I would be very grateful if you would complete both the enclosed questionnaires as fully as possible, place them in the stamped envelope provided and post them as soon as you are able. Please note that all confidentiality has been fully honoured and it will continue to be.

As a service I am offering to send each respondent a personalised Lifestyle Chart (like the one I gave you last year) so that you can see how you have progressed. I am also offering to send interested respondents a report of the results of my project once they are available. Please would you indicate on the Lifestyle Evaluation Questionnaire whether you wish to receive these.

If you have any comments or queries I can be contacted at:

(021) 696-2091
20 Sprigg Road
Rondebosch East
7780 Cape

Thank you very much for your co-operation.

Yours sincerely,

S.J. Wadlow (Ms).

APPENDIX E

STATISTICS FOR THE LEQ FACTORS

Time One

Factor	Mean	Std Deviation	n
Food	31.6	4.6	98
Drugs	21.0	3.1	98
Exercise	27.3	6.4	98
Care	35.4	4.9	98

Time Two

Factor	Mean	Std Deviation	n
Food	33.2	4.3	93
Drugs	20.9	2.8	93
Exercise	29.3	6.1	93
Care	37.0	4.4	93

Time Three

Factor	Mean	Std Deviation	n
Food	33.2	4.0	42
Drugs	20.8	2.6	42
Exercise	40.0	5.1	42
Care	37.8	3.0	42

Time One - Time Two

Factor	Mean	Std Deviation	n
Food	-1.38	3.71	85
Drugs	0.32	2.18	85
Exercise	-1.99	3.50	85
Care	-1.54	3.42	85

Time One - Time Three

Factor	Mean	Std Deviation	n
Food	- 1.00	4.32	42
Drugs	0.60	2.04	42
Exercise	-11.40	4.06	42
Care	- 1.29	3.52	42

Time Two - Time Three

Factor	Mean	Std Deviation	n
Food	-0.26	3.27	42
Drugs	-0.12	1.78	42
Exercise	-9.02	4.23	42
Care	-0.69	2.97	42

APPENDIX F

EXAMPLE OF A CROSS-TABULATION (McNEMAR)

An example of the output obtained from the BMDP4F programme (two-way frequency tables for categorical data) which was used to analyse response changes to individual LEQ questions over time.

FFFD corresponds to LEQ questions number 33 (food): Do you have fresh fruit or fruit juice at least once a day?

FFFD1 responses at Time One

FFFD2 responses at Time Two

1. A "no" response" to the question.
3. A "yes" response.

Observed frequency table 157

		FFFD2 1	FFFD2 3	TOTAL
FFFD1	1	13	13	26
	3	4	56	60
	TOTAL	17	69	86

20 cases had incomplete data

Number of excluded cases

FFFD1 \ FFFD2	In range	Missing	Too small	Too large	Unwanted	Total
In range	0	0	0	0	12	12
Missing	0	0	0	0	0	0
Too small	0	0	0	0	0	0
Too large	0	0	0	0	0	0
Unwanted	8	0	0	0	0	0
Total	8	0	0	0	0	20

Percents of row totals

		FFFD2		
		1	3	TOTAL
FFFD1	1	50.0	50.0	100
	3	6.7	93.3	100
	TOTAL	19.8	80.2	100

Percents of column totals

		FFFD2		
		1	3	TOTAL
FFFD1	1	76.5	18.8	30.2
	3	23.5	81.2	69.8
	TOTAL	100	100	100

Percents of table total

		FFFD2		
		1	3	TOTAL
FFFD1	1	15.1	15.1	30.2
	3	4.7	65.1	69.8
	TOTAL	19.8	80.2	100

Analysis of observed frequency table

Minimum expected value is 5.14

Statistic	Value	df	Probability
Pearson Chi Square	21.477	1	0.0000
Yates Corrected Chi Square	18.831	1	0.0000
McNemar Test of Symmetry	4.765	1	0.0290
Marginal Homogeneity	4.765	1	0.0290

Statistic	Value	ASE1	T-value Dep.
Kappa, measure of reliability	0.480	0.105	4.634

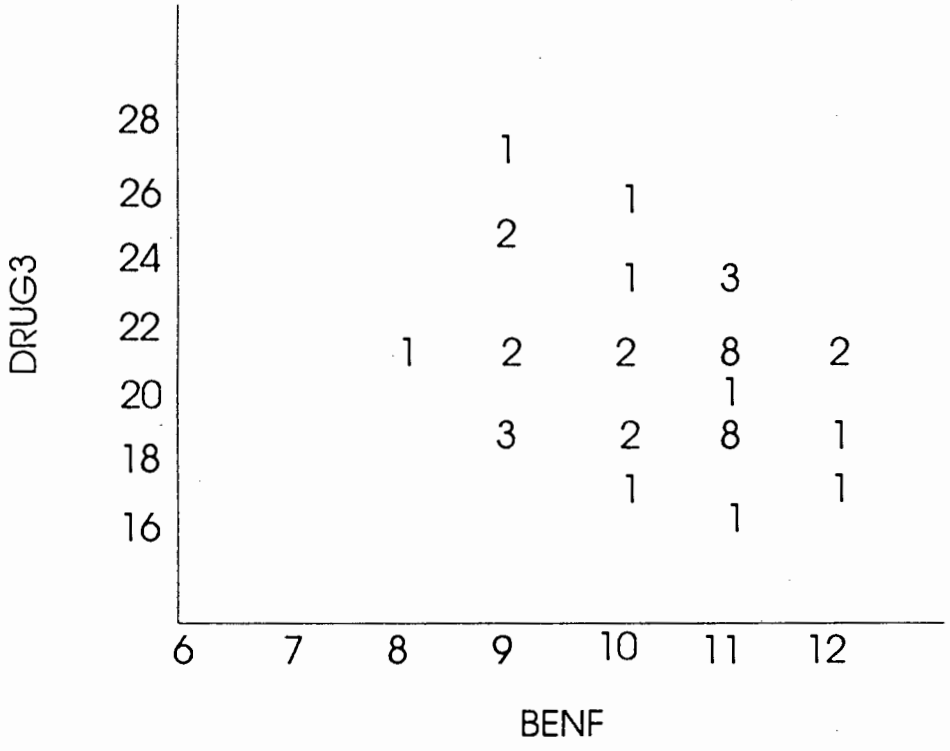
APPENDIX G

EXAMPLE OF A SCATTERPLOT/REGRESSION ANALYSIS

An example of output obtained from BMDP6D. These bivariate scatterplots with the correlation coefficient were used to determine whether LBQ components could predict LEQ factors at Time Three.

BENF = Benefits component scores of the LBQ.

DRUG3 = Drug factor score at Time Three.



N = 42
R = -.507
P < .001

Regression Line	res. ms	Mean	S.D.
Y = 32.122 - 1.0922X	5.1332	X 10.357	1.2061
		Y 20.810	2.5968

BENF versus DRUG3

APPENDIX H

EXAMPLE OF A CROSS-TABULATION (CHI-SQAURE)

An example of the output obtained from BMDP4F used to analyse associations between various individual LEQ and LBQ questions.

CSM3 responses to LEQ question number 19 (care) at Time Three: Do you tend to skip meals because you are "busy" and then fill up on snacks?

MIHL1 reponses to LBQ question number 2 (motivation): Do you feel it is important that you lead a healthy lifestyle?

1. "No" response to the question
2. "Sometimes"
3. Yes"

Observed frequency table 19

		MIHL1 2	MIHL1 3	TOTAL
CSM3	1	0	30	30
	3	3	9	12
	TOTAL	3	39	42

64 cases had incomplete data

Number of excluded cases

MIHL1

CSM3	In range	Missing	Too small	Too large	Uncounted	Total
In range	0	0	0	0	0	12
Missing	0	0	0	0	0	0
Too small	0	0	0	0	0	0
Too large	0	0	0	0	0	0
Uncounted	0	0	0	0	64	0
Total	0	0	0	0	64	64

Percents of table total

		MIHL1		
		2	3	TOTAL
CSM3	1	0	71.4	71.4
	3	7.1	21.4	28.6
	TOTAL	7.1	92.9	100

Analysis of observed frequency Table 19

Minimum expected value is 0.86

Statistic	Value	df	Probability
Pearson Chi Square	8.077	1	0.0045
Yates Corrected Chi Square	4.741	1	0.0293