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SELF-ESTEEM AND LOCUS OF CONTROL AS MODIFIERS OF THE RELATIONSHIP BETWEEN OBJECTIVE HEALTH AND SUBJECTIVE HEALTH IN THE ELDERLY

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ABSTRACT

An investigation was undertaken to explore the function of self-esteem and locus of control as possible moderators of the relationship between objective health and subjective assessments of health in the elderly. Subjects were 102 individuals, aged 60 to 94 years, drawn from seven preselected residences for the elderly, in two communities. Each subject was interviewed and measures of objective health, subjective health, personality and well-being were taken as well as demographic information. The hypothesis predicted that the personality variables, self-esteem and locus of control would each interact with objective health, to moderate between objective health and subjective assessments of health. The results of analyses revealed that neither self-esteem nor locus of control consistently interacted with objective health to predict subjective assessments of health. The main effects of self-esteem and objective health were, however, found to demonstrate strong and independent relationships to subjective assessments of health. Of the two types of variables objective health was found to have the strongest relationship to subjective assessments of health. This finding is in accord with previous research. Implications of the relationship between both variables and subjective health were discussed, as were methodological implications of the study.

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CHAPTER I

INTRODUCTION

Research into an individual's subjective health and his or her subjective health assessments is relatively new. Defined as a measure of an individual's health perception, subjective health assessments received no real interest from researchers until 1958, although examination of the literature prior to then reveals a few studies which did mention subjective health indirectly (cf. Suchman et al, 1958).

Two reasons account for the lack of interest an individual's subjective health received before 1958. Firstly subjective health was a topic of research outside of medicine's philosophical tradition of positivism. Subjective health, as data distinguished by subjective experience was thus regarded as suspicious and unworthy of investigation. Secondly, an individual's subjective health and subjective health assessment were viewed as filling no particular need, and as such were again ignored by research.

However, two factors in the late 1950's created interest in an individual's subjective health. One of these was the difficulty of conducting physical examinations on large numbers of individuals, as required in health programs. Whether a person's own estimate of his or her health could serve in the place of a physicians became an important topic of research. The second factor was a growing interest in subjective experience as important and valid data.

The first direct study concerning subjective health was carried out by Suchman et al (1958). This study investigated the validity of using subjective assessments of health as measures of objective health. The findings of this and later studies revealed a positive and consistent relationship between objective and subjective assessments of health; however the magnitude of the relationship was not strong. Later studies found demographic and other non-medical variables to be associated with subjective assessments of health in the elderly, although to a lesser extent than objective health. To the current date, however no research has been conducted on the possible influence of personality on an individual's subjective health.

Recently, personality has been found to be an important variable in explaining seemingly confusing relationships between objective events and an individual's objective and subjective reactions to these events (Antonovsky, 1979; Kobasa, 1979).

An individual's personality, for example, may explain why two individuals given the same objective health and demographics report differing levels of subjective health. One possible explanation is that personality variables moderate the effects of objective health in an individual and therefore explain his or her subjective health.

The purpose of the present study is to explore the relationship between objective health and subjective health, and the moderating effects the personality variables, self-esteem and locus of control have on this relationship.

These personality variables were chosen for investigation because research has shown them to concepts of major importance to the functioning of the elderly (Hunter et al, 1982; Palmore & Luikart, 1972).

The elderly were chosen as the focus for this investigation in line with previous research, because of a) the high number of health problems the elderly suffer and b) the saliency health thus has for them over other issues.

Chapter 2 will now discuss the objective health of the elderly.

CHAPTER II

OBJECTIVE HEALTH AND THE ELDERLY

In order to put the following chapter, which deals with the subjective health of the elderly, in proper perspective, it is first necessary to examine and discuss the objective health of the elderly. The first section of this chapter will define objective health and outline the two dominant perspectives as to what constitutes objective health in the elderly. The second section will discuss the various methods used to assess objective health in the elderly. The third and final section will then present the results of physiological and statistical research into the objective health of the elderly.

Objective Health

Although little agreement currently exists in the literature as to what constitutes an adequate theoretical or operational definition of health (Wolinsky & Zusman, 1980), there is agreement that health consists of two separate and distinct states; namely an objective state which is simply known as objective health, and a subjective state which is simply known as subjective health. As each state of health is best described with reference to the other, both objective and subjective health will be defined in this chapter. Subjective health, will however be defined and discussed in greater detail in Chapter 3.

Objective health is defined as the "actual" state of health that an individual experiences at any one point in time. As an "actual" state of health, objective health constitutes a reality based concept and as such is usually able to be verified by some form of objective test. An individuals objective health is indicated to others by that individual's physiological and/or physical functioning. Although objective health can additionally be defined in both mental and social terms (Stewart et al, 1977), its meaning usually is, and will be in this thesis, restricted to an individual's physical health.

Subjective health, in contrast to objective health, is not the "actual" state of health an individual experiences, but rather the perception an individual holds of his or her health. As a "perceptual" state of health, subjective health may or may not be based upon reality and as such is often more difficult to verify in an individual than objective health. An individual's subjective health is indicated to others by that individual's verbalised or written opinions, attitudes or feelings towards his or her health status.

For all individuals objective health exists on a continuum. At one end of the continuum is the state of "death" or no objective health and at the other end is the state of "perfect health". Theoretically none of these end states are attainable while an individual is living. "Perfect health" is unattainable because it exists as an ideal toward which people are oreinted rather than a state they expect to attain. Twaddle (1974) has noted one physician as saying:

> A healthy person is someone who has been inadequately studied (pg 31).

Classification of an individual's objective health is made with reference to those health states found between "death" and "perfect health". Various classifications of objective health arise according to firstly the classifier and secondly the degree of precision required when making an assessment of a person's objective health status. Laymen will, for example, often only perceive and thus acknowledge two classifications of objective health; namely that an individual is "healthy/well" or that an individual is "unhealthy/sick". Researchers in their investigation of objective health require and utilise more precise classifications of health status. Typically most researchers designate at least five objective health states of the form: "very poor", "poor", "fair", "good", and "very good" health.

Ideally an individual's subjective health should reflect perfectly his or her objective health, at least at the less precise levels of objective health classification. However in reality such a relationship does not always exist. While for some individuals, termed by Maddox (1964) "health realists", subjective health does closely correspond to their objective health status, for others large incon-

gruities can be indentified between the two states. When significant incongruity arises between subjective and objective health states in an individual, then that individual functions either as a "health optimist or overevaluator" or conversely as a "health pessimist or underevaluator" (Maddox, 1964). The former level of functioning can be seen in an individual who denies illness. Such an individual is by definition in poor objective health, yet will report his or her overall health status to be "good" or "excellent". A similar but reversed relationship occurs in the case of an individual classified as a hypochondriac. This individual is by definition in good objective health, yet will state that his or her health is "poor" or "very poor".

The existence of incongruities between an individual's objective and subjective health can be accounted for by a number of factors. Firstly the covert nature of some diseases can cause a health professional to make erroneous assumptions regarding an individual's objective health. Secondly inaccuracies in the methods and instruments used to assess both objective and subjective health can result in incongruity between the two health states. Finally but most importantly, an individual's subjective health, being perceptually based, is determined by many factors, some of which may be quite separate from and thus not reflect objectively verified conditions. Each of these factors will be referred to again more fully in this chapter and in Chapter 3.

Objective health in the elderly is usually defined in one of two ways; either 1) in terms of the presence or absence of disease, or 2) in terms of functional capacity (Chappell, 1981).

Those who hold the medical model or perspective on health, usually but not exclusively physicians, define objective health in terms of the presence or absence of disease, where "disease" connotes the concept of abnormality in an individual's physiological functioning. This definition of objective health is derived from the biological concept of man as a living and evolving organism. As an organism man is composed of cell, tissues and organ systems, each of which

must function adequately and in reasonable harmony with each other in order to ensure biological continuity (Twaddle, 1974). Under the medical model the presence of a disease is conceived as disrupting an individual's physiological functioning and subsequently altering also the individual's objective health.

Application of the medical model's definition of objective health is important in our society, in that it allows the practice of modern medical science. However the medical models definition of objective health also has its limitations. It is possible, for example, for an individual to feel "ill", e.g, experience pain, tiredness etc, without showing any evidence of an objectively verifiable disease. An individual may also be labelled healthy in terms of known diseases, yet suffer from a disease unidentified or unrecognised by medical science. Arthritis, for example, used to be considered a normal result of the aging process rather than the disease it is, and as such was left largely untreated in the elderly (Dovenmuehle, 1970). Finally certain diseases common to one culture are either not found in other cultures or are accepted there as representing "normal" health. Margaret Mead (1950), for example, found no evidence of morning sickness among the Arapesh and suggested that this was due to their almost complete denial that a child exists until shortly before childbirth. Ackerknecht (1947) reported that a certain skin disease (dichromic spirochetosis) was so prevalent among some South American tribes that the few single men not suffering from it were regarded as pathological to the point of being excluded from marriage.

Those who hold the functional model or perspective on health, usually but not exclusively sociologists, define objective health in terms of functional capacity. Under the functional model the things an individual can do or says he or she can do are taken as the best indicator of that individual's objective health. The functional model's definition of objective health is derived from the sociological concept of health. Under this concept objective health is viewed as the presence or absence of illness, where "illness" connotes the concept of an inability to perform social roles. Parsons (1964) taking this perspective describes "perfect" health as a state of optimum capacity for the effective performance of valued tasks.

The functional model arose mainly because of the limitations inherent in the medical model's definition of objective health. Such a perspective on objective health is important in that it permits conceptualisation and measurement of health in terms of departures from normal role functioning, rather than from medical or biological criteria. However the functional model's perspective on objective health, also has its limitations. A major limitation of the functional model is its disregard of an individual's disease state. It is possible, for example, for an individual to feel well and function adequately while having a disease which is presymptomatic or asymptomatic. In addition an individual's functional capacity, while able to be objectified, is still ultimately dependent on the values a given society places on those capacities.

The perspectives taken by those under the medical model of health and those under the functional model of health are not, however, irreconcilable. Shanas and Maddox (1976) report that geriatric specialists have largely accepted a position of compromise between the view which defines objective health in the elderly as the presence or absence of disease and the view which defines objective health in terms of functional abilities.

Objective Assessment of Health

An objective assessment of health is an evaluation of health against some acknowledged "objective" standard. Traditionally in our society this acknowledged objective standard is the opinion or judgement of a medical professional. With the advent of research, however, other objective standards not utilising medical professionals have also been established and recognised over the past two decades.

Objective health in the elderly can be assessed in one of two ways; either with reference to the individual or with reference to the population as a whole.

Assessment of an elderly individual's objective health allows examination of that individual's disease state, ability to function and other aspects of his or her health such as the degree of pain or discomfort he or she may suffer. Assessment of the elderly pop-

ulation's health, on the other hand, allows examination of the health of the elderly from a global perspective.

These two levels of assessment and the various methods used within each to assess objective health in the elderly will be briefly discussed in turn.

The assessment of an elderly individual's health is usually made for one of two reasons. Most commonly objective health assessment of an elderly individual is made for the purpose of diagnosis and treatment of disease and illness. Less commonly objective health assessment of the elderly individual is made for research purposes.

Objective assessment of an elderly individual's health, for the purpose of diagnosis and treatment, is traditionally associated with examination by a physician. This method of assessment is designed to extract clinical evidence confirming or denying the presence of a disease and as such adheres to the medical model's conception of objective health. Two types of evidence are generally recognised by physicians as revealing the presence of a disease state. The first of these, known as "signs", consists of directly observable events such as fevers, palpable masses, measurements of blood pressure, and the results of laboratory analysis. "Symptoms", in contrast to signs, are not directly observable to the physician but become known through the patients verbal reports. Symptoms can include complaints of pain, impairment of capacities and other changes noted and reported by the patient.

From the signs observed and the symptoms reported, a physician is able to assess an individual's physiological functioning and judge subsequently that individuals degree of deviation from the established health norms. Because of the physician's professional training, the objective health status he or she assigns to an individual is usually considered to be the most "objective" judgement of health status possible.

However while a physician's judgement strives for objectivity, the objective health rating given may, as noted, not always reflect an individual's true physiological standing. The physician's medical sophistication and training, his or her attitudinal set, the conditions

he or she expects to find in an individual of a given age and sex, and the social climate of the time can all affect the validity of an objective health rating made on the basis of a physical examination (Simmons, 1963).

In research, however, a physical examination has not always been a feasible nor a practical method of obtaining an objective health rating. Factors such as the high cost involved, the large amount of time needed and the difficulties associated with arranging physical examinations for elderly individuals has often resulted in other methods and measures being used to obtain objective health ratings.

One alternative method of objective health assessment that still adheres to the medical model's conception of objective health is indirect examination of an individual by a physician or physicians. Indirect assessment of health involves a physician or physicians judging or ranking an individual's objective health on the basis of that individual's medical records and/or data pertaining to that individual's current and past health history (LaRue et al, 1979). Compared to a physical examination, indirect assessment by a physician is a less objective method of health assessment, although ultimately the objectivity of the health ratings derived from this measure depend on the extent and the accuracy of the data presented to the physician or physicians to rate.

Health indexes and questionnaires which tap the degree of symptomology an individual possesses are a second alternative method of objective health assessment frequently used in research. One example of a medical questionnaire commonly seen in health research is the Cornell Medical Index (C.M.I) (Abramamson, 1966). This index which may be either self-administered, or administered by an interviewer, was developed as a quick and reliable means of obtaining facts about a patient's medical history without expenditure of a physician's time. The C.M.I consists of 195 questions examining symptomology, past history, family history and behaviour, in eighteen item groupings. Many studies have been made using the C.M.I in a large variety of settings. One major limitation of health indexes and questionnaires is their dependency on the respondent's self-reporting of symptoms,

which research has found at times to be unreliable (Kutner et al, 1956; Haberman, 1969).

Objective assessment of an elderly individual's health can also be carried out from the functional model's perspective. Typically this is done through the use of trained assessors of functional disability (Martini & McDowell, 1976) or alternately through the use of functional status questionnaires. The purpose of functional assessment is to elicit behavioural rather than clinical evidence from an individual regarding his or her functional disabilities. One questionnaire used often to assess functional disability is the index of Activities of Daily Living (A.D.L) (Katz et al, 1963). The ADL was designed to assess limitations on the elderly's functioning in six areas that are considered biologically primary; bathing, dressing, toileting, transfer, continence and feeding. The overall score on the index reflects increasing levels of dependency upon others. Some limitations of functional disability measures include their failure to distinquish disability due to chronic diseases from those of acute conditions and also their instability in measuring certain disease states. Scores on the ADL, for example, would change substantially with changes in disability attributable to an unstable disease such as multiple sclerosis, even though the prognosis of the patient would remain consistently morbid (Stone et al, 1979).

The assessment of the elderly population's health is usually made for statistical and research purposes. In addition assessment of the elderly population's health is often made in order to determine the current demand for health services. Traditional measures of health status of a population include mortality and morbidity.

Mortality refers to the death rate of a given population or more specifically the total number of deaths in that population compared to the total population (Dorland, 1951). By and large death is a well defined and measurable event in our society. In New Zealand, as in many other countries, deaths must be registered and a physical cause of death established. As such mortality has been useful for measuring the health status of populations such as the elderly and for comparing populations over a long period of time. Mortality data is less use, however, when precise indications of a population's

health problems are needed. People do not die, for example, from obesity as such, yet it is considered to be a health problem; one that would not be revealed by mortality data. Others have noted that mortality data lacks validity as the population in question ages. For example it has been found that death of an elderly person is likely to be attributed to old age rather than a plausible disease state (Bell et al, 1983).

Health statisticians realising the problems of using mortality based data for health evaluations began, in the mid 1960's, to investigate a class of data called morbidity. Morbidity refers to the prevalence of illness or degree of wellness in a given population, or more specifically, the relative incidence of disease, disability, activity and functional ability in a population. Morbidity data summarises a particular health experience for a given population, e.g, all elderly with cancer or all elderly visiting a hospital in one year. As such morbidity data is better able than mortality data to characterise a particular health condition. However morbidity data also has its limitations. Difficulties both in the process of defining measures of morbidity and eliciting morbidity data frequently limit the reliability and validity of morbidity (Balinsky & Berger, 1975). Bell et al (1983) have pointed out that much morbidity data is influenced by factors that have little to do with health status. It is, for example, considered less desirous today to admit elderly to hospitals or nursing homes, if they can be nursed at home.

Objective Health of the Elderly

Biologically, objective health status is seen to deteriorate as an individual ages. Physiological research has found many irreversible physical changes that accompany normal aging (Weg, 1978). These are briefly presented below.

Cell death in the skin, blood, liver, gastro-intestinal tract and bone marrow is hypothesised to exceed the rate of replacement in the elderly. More importantly the cellular units in the central nervous system are non-regenerative and this is believed to be a crucial factor in the aging process. As aging progresses the speed

of the central nervous system slows down and this is reflected in the elderly becoming less sensitive to pain as they grow older.

Structurally the elastin fibers become thicker and less elastic in old age. Changes also in the bone structure result in a loss of height, a stooped posture and significant limitations in mobility. Changes in mineral metabolism in old age results in calcium leaving the bones and investing the soft tissues. As a result the risk of bone breakage increases, especially in women.

There is a measurable and progressive reduction in basal oxygen consumption in the aging individual. As a result breathing becomes more difficult and blood pressure rises. Overall there is a decrease in the capacity of the heart to respond to extra demands.

There is also a decrease in the sense of smell, taste and hearing. After the age of forty, poor vision becomes increasingly common. A loss of teeth occur simultaneously with an increase in related dental problems.

During aging a reduced mobility of the stomach and intestines occurs with a resulting increase in constipation, hemorrhoids and a decrease in fluid intake. Finally there is an increase in urinary incontinence and in the frequency of urination.

In addition to physiological deterioration during aging there is considerable evidence that both chronic and acute diseases increase with advancing age. Leavell and Clark (1953) indicate that the host factors commonly associated with aging result in an increased prevalence of long-term illnesses involving circulatory impairments, metabolic dysfunctions and neoplasms.

Shanas & Maddox (1976) report that of individuals 65 years and older living in the community, 85% report at least one chronic disease and about 50% report functional limitations of some type related to chronic health conditions. Acute episodes of illness and injury were also noted as common, with older persons reporting on the average at least one acute disease each year, and most commonly respiratory illness.

Studies carried out in different countries have found a similar level of chronic health problems amongst the elderly. Stenback et al (1978) reported the findings of a large field study of health problems in Finland. In all the health of 16,576 persons aged 15 years and older were studied. Of those 1,476 persons aged 65 years and above, 69.3% were reported to have some form of chronic disease.

Summary

In summation, objective health refers to an individual's actual degree or level of health. In the elderly objective health has been perceived in two ways; firstly as the presence or absence of a disease and secondly as the degree or level of functional capacity. Objective assessment of health refers to the "objective" measurement of an individual's health. Objective assessment of health from a physiological perspective and in relation to both acute and chronic disease, reveals the elderly to be generally in poor objective health.

CHAPTER III

SUBJECTIVE HEALTH AND THE ELDERLY

This chapter will now focus on the subjective health of the elderly. The first section will redefine subjective health, examine the role of perception in subjective health and discuss the two types of subjective health an individual may possess. The second section will then define subjective assessments of health, outline the historical antecedents concerning subjective health and list the various perspectives from which subjective health has been studied. Finally the research findings arising from these investigations into subjective health will be presented.

Subjective Health

Subjective health, as noted, is the perception an individual holds of his or her own health status. As such subjective health has also been referred to in the literature as "self-perceived health" or more simply as just "perceived health".

Perception, as defined by the Concise Oxford Dictionary (1964), is the:

> Act (or) faculty, of perceiving;...(and) philosophically (the) action by which the mind refers its sensations to an external object as cause;... (pg 902)

In contemporary psychology perception has commonly been treated as an intervening variable, which is dependent for expression, not only upon an object or objective event, but also upon an individual's learning, set, mood and current emotional and motivational state (Chaplin, 1975).

Contemporary psychology's definition of perception has two major implications for those investigating subjective health. Firstly

the perception an individual has with regard to his or her health will be determined not only by his or her objective health, but also by factors specific to that individual. Secondly, an individual's perception of his or health will be different to another individual's perception of the same health event, because each individual will perceive in terms of those aspects of the health event which have special significance for him or her. These two implications partially explain why subjective health may not perfectly reflect objective health in some individuals. These two implications also suggest a number of potential hypotheses concerning factors which may determine or influence an individual's subjective health, one of which will be investigated in this study.

Two types of subjective health can be identified in an individual; namely "global" subjective health and subjective health that will be labelled in this thesis "specific". However although it is possible to identify two types of subjective health, researchers have done little to distinguish between them in the literature. As a consequence research findings concerning subjective health are often complicated by the type of subjective health discussed and the subsequent subjective health measure used.

Of the two types of subjective health, "global subjective health" has been the most commonly researched. "Global subjective health" is defined as an individual's perception of his or her "overall" health status. "Specific subjective health", on the other hand, is a less commonly discussed and measured form of health perception. "Specific subjective health" is defined as an individual's perception of "specific" aspects of his or her health status. Such aspects can include, for example, an individual's perception of his or her health compared to another individual (Wan, 1976) or an individual's perception of the degree or type of symptoms/illnesses he or she currently suffers from (McCrae et al, 1976).

Subjective Assessment of Health

Subjective assessment of health refers to the measurement of an individual's health perceptions. Typically health perceptions

are assessed through an individual's verbalised, or written opinions, attitudes or feelings toward his or her health status. As such a subjective assessment of health can be seen as an overt expression of subjective health. Subjectively assessed health is also known in the literature as "self-rated", "self-reported" and "self-evaluated" health.

Studies employing global subjective assessments of health typically ask one or several questions of the form: "In general would you say that your overall health is very poor, poor, fair...or very good?". The conclusion an individual reaches and reports in response to these questions has been named his or her "health identity" (Stenback et al, 1978). The few studies that employ specific subjective assessments of health ask questions of the form: "Compared to others your own age, how do you rate your health at the present time; very poor, poor...etc" or "How many times this year have you had a cold?". Generally in this thesis the majority of the studies reported employ global subjective assessments of health status. Those studies that do not will be identified as such.

For research purposes, classification of subjective health is usually made according to the same health states used to classify objective health.

Compared to other areas of health, the study of subjective health is a relatively new endeavour, having been conducted only over the last two decades. Generally two reasons account for the lack of research concerning subjective health prior to this period.

Firstly, little interest was shown in an individual's subjective health due to the medical profession's philosophical tradition of positivism, which dominated and still dominates thinking about an individual's health. Because the task of the medical profession is primarily concerned with the diagnosis and treatment of objective health disturbances, there was a tendency to consider the objective aspect as the only relevant one. Secondly although an individual's subjective and objective health were recognised as separate, subjective health was ignored as it was perceived as filling no current need.

However interest in an individual's subjective health and in particular his or her subjective assessments of health was kindled in the late 1950's and 1960's for two reasons. Firstly the practical difficulties and prohibitive costs of conducting physical examinations on large numbers of people, as required in health programs, produced a need for a proxy measure of objective health. Whether a person's own estimate of health could serve in place of a physician's, thus became an important topic of research. Secondly during the 1960's there was renewed interest in subjective aspects of human behaviour and experience, including subjective health. Peoples' perceptions regarding their health began to be recognised as having meaning in their own right.

Early research focused on the elderly person's subjective health because of the increased number of health problems the elderly encounter and the saliency health has for them over other issues (Lipman, 1962). Later and current research has also focused on the elderly population for the same reasons. A few studies have, however, investigated perception of health in populations other than those of the elderly (Martini & McDowell, 1976).

Subjective health has been studied from a number of perspectives, the first of which concerned, as noted, whether a person's subjective assessment of his or her health could serve in the place of an objective assessment of health. Other questions have been raised concerning factors which determine or are related to subjective health assessments. In particular the effect attitudinal, behavioural and demographic variables have on subjective health assessments have all been studied. More recently subjective assessments of health have been studied for their value as predictors of subsequent adjustment to illness.

Finally the validity of using subjective health assessments as a predictor of longevity and mortality have also been investegated, Surprising though, is the complete lack of research investigating the relationship between an individual's personality and his or her subjective health.

Subjective Health Literature

As noted, research into subjective health initially focused on external validation, i.e., the comparison of subjective health assessments to those derived from medical sources. The overall findings of this research has lead to general agreement that some degree of association is present between objective health and subjective assessments of health.

Suchman, Phillips and Streib (1958) compared the general health ratings physicians made between 1952 and 1954, of 996 retired individuals aged 65 years and over, with self-evaluations of their health during the same period. Subjective assessments were made in response to the question: "How would you rate your health at the present time: very poor, poor, fair, good or excellent?". Physicians' ratings were made on the same scale. For analysis purposes the ratings were reduced to either "favourable" or "unfavourable" (health). The relationship between general health ratings by physicians and self-ratings on general health was found significant at the .01 level of probability. Specifically Suchman et al (1958) discovered that when the physician said a person's health was favourable, about 77% of the subjects agreed and 23% disagreed. When the physician said that the subject's health was unfavourable, about 61% of the subjects said the same and 39% disagreed.

In a replication of Suchman et al's (1958) study, Friedsam & Martin (1963) compared subjective assessments of health and physician's ratings of 87 white subjects aged 50 years of age and older attending an out-patient clinic. Interviews with the out-patients, including subjective health assessments were obtained as they waited for their appointments. Physicians' ratings were those of the medical resident serving the out-patient clinic and were made immediately upon the completion of the patient's appointment. Subjective and objective assessments of health were made in response to a five-point scale ranging from "very poor" to "excellent" (health), and in both the responses were also dichotomised as "favourable" and "unfavourable".

In this study subjective assessments of health and physicians'

ratings were found to correlate at r=.33 with about 58% agreement when the physician said the patient's health was favourable.

One criticism that can be made of Friedsam and Martin's (1963) study is its use of a small and unrepresentative sample. In addition both Friedsam and Martin (1963) and Suchman et al (1958) discriminated finally between only two levels of subjective health: "favourable" or "unfavourable", and as such the interpretation which may be placed upon the results is somewhat unclear (Tissue, 1972).

Maddox (1962) also tested the external validity of subjective health assessments. Subjects were 251 voluntary subjects, aged 60 -94 years, participating in a longitudinal study of aging. Classification of subjects by self-assessment was based on answers to the question: "How do you rate your health at the present time?". The health status of subjects who answered "excellent" or "good" was designated "subjectively good" while the the health status of those answering "fair", "poor" or "very poor" was designated "subjectively poor". As such interpretation of results in Maddox's (1962) study can also be questioned. In addition the placement of "fair" health is also a questionable issue. Objective health status was determined by a comprehensive medical evaluation.

Medical evaluation and subjective assessment of health was found in Maddox's (1962) study to be related positively. For 2 out of 3 subjects (65%), subjective assessments of "subjectively good" health, coincided with a medical evaluation of "medically good" health.

Other studies have also found positive and statistically significant relationships between medical evaluation and subjective assessments of health, with correlations between the two reported as ranging from r=.15 to r=.36 (Heyman & Jeffers, 1963; Maddox & Douglass, 1974; Garrity et al, 1978; LaRue et al, 1979; Tissue, 1972; Ferraro, 1980; Linn et al, 1980; Mossey, 1982).

The findings of a statistically significant and positive relationship between subjective health assessments of the elderly and those of the physician has encouraged some researchers (LaRue et al, 1979; Fillenbaum, 1979; Ferraro, 1980) to endorse subjective assessments of health as measures able to be validly substituted for a medical

examination and used also for medical research.

Other researchers however have warned against using subjective assessments of health as proxy measures for objective health (Suchman et al, 1958; Friedsam & Martin, 1963; Tissue, 1972; Garrity et al, 1978; Ekerdt & Bussé, 1982; Mossey, 1982). They found that although the relationships between general health ratings by physicians and self-ratings were significant, the relationships were still only marginal, and the discrepancies between the two ratings too large to advocate their use as a valid "medical" measure. Tissue (1972) stated that while subjective assessments of health may be reasonably good predictors of objective health, they still misclassify substantial numbers of cases even at the division into simple "good-poor" levels of health. His conclusion was that general self-ratings of health could not be substituted for clinical examinations without a substantial margin of error.

Two other findings also arose from the early research into subjective health assessments of the elderly. The first of these is the finding that subjective health assessments by the elderly appear to be reliable over time. That is elderly individuals generally report their health the same way when asked to give objective health estimates twice. The second is that elderly individuals on the whole estimate their health more favourably than the objective health ratings assigned to them.

Evidence that self-ratings of health remain comparitively stable over time was initially provided by Heyman and Jeffers (1963). The subjects for their study were 182 elderly out of an original sample of 256 who returned on an average of three years later, for a second series of two-day health examinations. Subjective health assessments were gathered in response to the question: "How would you rate your health at the present time?". Objective health was measured by a physical functioning rating, given after a medical history, physical and neurological examinations, as well as ophthalmological and dermatological examinations.

The results showed that 76.3% of the subjects had remained un-

changed in their subjective health estimates between the first and second series of health examinations. For those who changed (23.7%), there was no statistically significant difference in the movement from good to poor or poor to good health.

Maddox and Douglass (1974) also found that subjective health assessments were not random phenomenon, but were persistently and positively related to objective evaluations of their health status over 15 years of their study. Subjects were 83 available panelists from 270 non-institutionalised ambulatory persons aged 60 years and over, who had been studied 15 years prior. Subjective health assessment was based on responses to the question: "How do you rate your health at the present time?". The response catergories were: excellent, good, fair and poor. Objective health status was measured on a six-point scale of physical functioning following an extensive medical and psychiatric evaluation by a project physician. It was found that in each of the six observations spanning 15 years, 2 of 3 panelists displayed congruous ratings. They also found that an individual's self-health ratings were more stable over time than the comparible physician's rating.

Additional research (Brown & Rawlinson, 1976; Garrity et al, 1978; Linn et al, 1978) has also found subjective assessments of health to represent a relatively stable perception held by the individual. One possible limitation of this type of research however is selective effects "subject mortality" has on research findings. For example it is possible that only those subjects whose health was both oblectively and subjectively good, maintained contact with the researchers. Regardless of this possibility Mechanic (1979) attributes some of the stability of subjective health assessments to their learnt origin in childhood and shaping by society.

A finding that has been confirmed in several studies is that elderly individuals generally tend to estimate their health more favourably than do their physicians or other measures of objective health. Suchman et al (1958), for example, found that subjective health assessments consistently tended to greatly overestimate the

favourableness of an elderly individual's health condition, as indexed by physicians' ratings. LaRue et al (1979) similarly found that when the subjective assessments of health and objective assessments were not congruent, the physicians tended to assign lower ratings in 15 out of the 20 cases involved.

Other studies (Maddox & Douglass, 1974; Shanas, 1974; Linn et al; 1978; Blazer & Houpt, 1979) have also found the elderly to be generally over optimistic with regards to their health, even though certain rewards such as sympathy and attention are often associated with the adoption of the sick role (Lipman, 1962). Linn et al (1980) has suggested that overestimation of health status in the elderly may be explained by the fact that those individuals who live into extreme old age, are in fact healthy or healthier than those elderly persons in their sixties, many of whom die from leading killer diseases. However this explanation appears unlikely. Maddox and Douglass (1974) in their study, found that the "health optimists" in fact evidenced more pathology than "health pessimists" when compared in terms of the presence or absence of seven chronic disease processes.

More plausible explanations of health overestimation in the elderly have been suggested by some researchers to lie in factors aside from that of objective health. Maddox (1962), for example, found that when objective health assessments were controlled, "health optimism" and "health pessimism" were related to both social placement and attitudinal factors. Research into subjective health assessments will now be discussed from the perspective of how attitudinal and behavioural variables are associated to self-ratings of health status.

Specifically Maddox (1962) found overestimation of health as evidenced in "health optimism" to be related to degrees of preoccupation with health and adjustment to the environment. He also found "health optimism" and "health pessimism" to be related to age and social status. In his study, 251 volunteer subjects, aged 60 and over were assessed with regards to 1) their subjective health 2) their objective health 3) their placement in the social structure and 4) their pre-occupation with health and adjustment to the environment. Findings were that "health optimism" was related to lack of concern over health matters and good adjustment to the environment. "Health pessimism"

was found to be associated with the absence of these two characteristics. Findings with regard to age and social structure are discussed later in this chapter.

Suchman et al (1958) in a second part to their study, examined the relationship between the health ratings made by the physicians and elderly subjects; and attitudinal and behavioural correlates of health. The four attitudinal correlates were derived from questions about the subject's degree of health worry, his or her happiness, his or her age-perception and the overall degree of dejection he or she suffered from. The five behavioural correlates of health assessed the subject's daily activities, how much his or her health interfered with work, his or her utilisation of a doctor, bed disability and mortality of the subject two years subsequent to the original contact.

With regard to the correlation of objective and subjective health with attitudes, Suchman et al (1958) found subjective health assessments to be significantly related to all attitudinal items, while physicians' ratings were only significantly related to one attitudinal item. To Suchman et al (1958) this added weight to the argument that subjective health assessments were determined by more than just objective health. They stated in their article:

> There can be little question that self-ratings of health are based upon many other factors besides actual physical health. It is not so much that self-ratings are "wrong", but that they represent "perceived" health, rather than "actual" health and as such may have even greater validity for certain purposes than a medical examination.
>
> (pg 226)

More recent evidence by Wolinsky et al (1984) also found subjective health assessments to be based upon factors other than objective health, although objective health still retained it's position as an important determinant of subjective assessments of health status. Specifically Wolinsky et al (1984) used factor analysis to examine

the interrelationships between seven currently available measures of health status and the underlying dimensions they represent. Wolinsky et al (1984) found that the subjective health measure loaded heavily onto a factor they labelled the "global" dimension of health status. This dimension clearly represented a consistent theme; namely an individual's perceptions of his or her well-being. The second and only other significant factor identified represented a functional dimension of health status, upon which the "objectively" evaluated health measures loaded. The correlation between the two was found to be r=.37. Wolinsky et al (1984) found this result to be in accordance with the research already noted which showed a definite though not overly strong relationship between objective and subjective health assessments.

Behaviour has also been found to be related to the elderly's subjective assessments of health. Tissue (1972), for example, reported that subjective health assessment was correlated with how elderly individuals describe their functioning as well as how they classify their health problems. Suchman et al (1958) found that 1) health ratings by physicians were not more closely related to behavioural items than were subjective health assessments and 2) that self-ratings were more closely related to relatively subjective behavioural items than those items requiring a description of objective behaviour. Suchman et al (1958) argued that these findings gave additional support for recognition of self-health ratings as measures of "perceived" health rather than "actual" health. Friedsam and Martin's (1963) replication of Suchman et al's (1958) study acheived the same general results and conclusions.

Maddox (1962) found a consistent positive relationship between subjective assessments of good health and relatively high levels of activity in elderly subjects. In particular high levels of activity were positively associated with individuals he termed "health optimists". Stenback et al (1978) also found that people who denied illness, i.e., "health optimists" were people with a strong interest in activity, but in their study this activity was socially oriented. Finally Wolinsky and Zusman (1980) noted that rural residents and especially farmers traditionally tend to overrate their health as long as they are physically capable of working.

A large number of researchers have found subjective health assessments and the degree of life satisfaction an elderly individual enjoys, to be significantly related.

Palmore and Luikart (1972) investigated health, activity, social-psychological and socioeconomic variables thought to influence well-being in 261 males and 241 females aged 45-69. Subjective health was measured by a "Cantril Ladder" (Cantril, 1965) with the bottom of the ladder (0) representing the most serious illness deemed possible, and the top of the ladder (9) representing perfect health. Well-being was measured on a similar scale. The respondent was asked "Suppose that the top of the ladder represents the best possible life for you, where on the ladder do you feel you stand at the present time?".

Of the eighteen variables measured, subjective health assessments were found by far to be the strongest correlate of life satisfaction ($r=.43$).

In a study aimed at identifying the health needs of an elderly Italian population, Figa-Talamanca (1976) also provided evidence for a positive relationship between subjective health assessment and life satisfaction. Subjects were 1291 individuals 60 years and over. Global subjective health assessments were made in three catergories; namely perceived "good", "relatively good" and "poor" health. Life satisfaction was gauged by a number of self-report items. Figa-Talamanca (1976) found that persons with a stable and positive emotional state and those who were satisfied with the way they spent their free time, assessed their health as "good" more frequently than those who were emotionally unstable or who were unsatisfied with the way they spent their time. These relationships were significant at the .005 level of probability.

Wan (1976) used two-stage multivariate analysis to examine factors affecting a measure of "specific" subjective health. Subjects were 11,153 noninstitutionalised adults aged 58-63. Subjective health was determined by the subject's assessment of how their health compared with others their age. The analysis identified sociodemographic differentials in these assessments and verified the relative importance

of 12 health-related indicators, in predicting subjective health assessments. Indicators of psychological well-being included a measure of "happiness" and general life satisfaction. The results showed that perceived personal happiness was only one of two non-sociomedical indicators which proved predictive of self-assessed health status.

Others (Maddox, 1962,1964; Bultena, 1971; Garrity, 1973; Campbell et al, 1976; Garrity et al, 1978; Larson, 1978; Blazer & Houpt, 1979) have also noted or found significant positive relationships between well-being and self-health assessment.

A number of studies have demonstrated that psychological and psychophysiological adjustment are associated with subjective health assessment. In general, poorer functioning, either psychologically or physically has been found to be significantly associated with poorer perceptions of health status in the elderly.

Nowlin (1972) investigated the link between depression and poor subjective and objective health in 157 community volunteers with a mean age of 72.3 years. These subjects were followed as part of a ten year longitudinal study of aging. During the ongoing evaluation procedure, each study participant spent 45 minutes to an hour involved in a psychiatric interview. On the basis of this interview, each person was rated for severity of depressive symptoms on a 0 through 5 graduated scale. Two subject groups were thus defined: a "depression" group and a "no depression" group. Subjective health was assessed on a 0 through 5 scale, with 5 indicating excellent health and 0 implying very poor health. Objective health was based upon a physicians findings during the medical examination at each visit. At the end of his interaction with the study subjects the examining physician rated each subject in terms of overall health, on a 0 through 5 scale, with higher scores denoting better health.

Nowlin (1972) found that the depression group consistently rated itself, and was found to be objectively in poorer health than the non depression group. Furthermore this relationship was not transient in nature, but persisted over the course of a decade.

Maddox (1962) found in his study that past as well as current depression was associated with the likelihood that an elderly individual would assess his or her health as poor. Brown and Rawlinson (1975) found poor subjective assessments of health in patients recovering from open-heart surgery was also invariably associated with depression.

While it might be suggested that poor objective health explains the link between subjective assessments of poor health and depression in these studies, Blazer and Houpt (1979) provide evidence that this might not be the case. In their study they found perception of poor health in healthy elderly to also be associated with depression, as measured by the Mini Mult.

Tessler and Mechanic (1978) examined the association between psychological distress and an individual's subjective health. Subjects were drawn from four diverse data sets, which included individuals participating in a health insurance scheme, a sample of university students, a sample of prisoners and a sample of persons aged 49-69 participating in a longitudinal research project on aging. Subjective health was measured differently in all data sets, although it was generally of the form: "How about your personal health...would you say that overall it is excellent, good, fair or poor?". Various measures of psychological distress and objective health were also used in each data set. Variables studied in addition to psychological distress included age, race, sex, education and marital status.

Tessler & Mechanic (1978) found that the only variable that retained a statistically significant relationship to subjective assessments of health in each data set, aside from objective health, was psychological distress.

Earlier research also demonstrated the existence of a relationship between distress and subjective health. Greenly and Mechanic (1974) found perception of poor health in a large sample of college students to be associated with reports of greater psychophysiological distress, as measured by Langner's Index (Langner, 1962). Mechanic (1974) reported that in a sample of 151 women in London, poor subjective health assessments were related to a variety of psychophysiological symptoms such as tiredness, poor appetite and difficulty sleeping.

Garrity et al (1978) found significant correlations between perceived health and the stressfulness of life (r=-0.20) and recent life change (r=-.31).

Two studies dealing with or noting the relationship between life change, marital relationships and subjective health have been identified in the literature. In one of these Thompson et al (1984) found that recently bereaved widows subjectively assessed their health as poorer compared to non-bereaved subjects, even though they did not differ from these controls on the number of physicians visits they made or hospitalisations they attended in the two month period. Wan (1976) found that divorced and separated individuals were more likely than married, widowed or never married persons to rate their health as worse than that of others their own age.

In addition to being found related to depression and psychological stress, subjective health assessments have also been found related to mental illness. Kay and Roth (1961) in a study of mentally disturbed old people found that the single item most clearly related to their eventual psychiatric diagnosis was their response to the question: "How is your health?".

Blazer & Houpt (1979) also found subjective health assessments to be related to mental functioning. In their study of healthy elderly, those subjects with poor health perceptions were judged to show higher impairments in mental health compared to those with perceptions of good health. In particular healthy elderly with poor subjective health assessments were found to have a greater propensity to use tranquilisers. These subjects were also more likely to feel a need for consultation with a trained counsellor.

Age, sex, race, culture, education, socioeconomic status and work status have also been shown to correlate in various ways with perceptions of health in the elderly.

Older elderly persons, for example, have been found to give more favourable assessments of their health than younger elderly persons (Maddox, 1962,1964; Bussé, 1966; Tornstam, 1975; Figa-Talamanca, 1976; Ferraro, 1980; Cockerham, 1983).

Cockerham (1983) investigated the relationship between age and "specific" subjective health in 660 adults aged 18 to 93 years, with a mean age of 45. The data for this study was collected as part of a larger study by telephone interviews of 707 individuals aged 18 and over. Subjective health was measured by the respondents answer to the question: "Compared to others your age, how would you rate your health?". The responses were coded as follows: (1) much worse (2) somewhat worse (3) about the same (4) somewhat better and (5) much better. Other variables measured included age, sex, education, income, race, marital status and number of symptoms.

Cockerham (1983) found that the respondents began to assess their health as "much better" than others of their age, after they entered the sixth decade of life. Overall, the proportion of individuals who felt their health was "much better" than others of their age was approximately two times greater for people 60 years of age and over than for those under 60 years.

Tornstam (1975) and Figa-Talamanca (1976) also found older persons to give more favourable self-assessments of their health compared to younger persons.

In Tornstam's (1975) study "specific" subjective health of 469 subjects aged 45-75 was measured by an item which examined current satisfaction with health status. Objective health status was measured by a checklist of 25 different symptoms commonly observed in the age span studied. Tornstam's (1975) overall findings were similar to those of Cockerham (1983) in that older subjects were found to be more satisfied with their health than younger subjects.

Figa-Talamanca (1976) used, as previously noted, global measures of subjective health. The results from this study showed that there were more individuals over 80 years making subjective assessments of good health than those between 60 and 80 years.

Findings of increasing subjective assessments of good health with aging has puzzled gerontological researchers. Because it is a biological fact that health deteriorates with age it would be expected that the old and especially the very old would assess their health

poorly. Two reasons have been proposed to account for this apparently discrepant relationship. One suggestion is that the elderly as they get older become a psychological,physiological and social elite due to the effects of selective mortality (Maddox, 1964). This suggestion is backed by Cumming and Parlegreco (1961). They state:

> There is some evidence that living to be over 80... is associated with being a member of a biological and possibly psychological elite. Furthermore, very old people often have a suprisingly high level of social competence and seem able to maintain high spirits. (pg 201)

While those living over 80 may well be members of a psychological elite, research by Ferraro (1980) disputes a direct causal link between good objective health and subjective assessments of good health in this age group. Ferraro (1980) found in his study that the old-old individual (75+) who considered his or her health to be "excellent" manifested about the same degree of disability as old individuals (65-74) who considered their health to be "good". Thus older individuals gave subjective assessments of good health, in spite of, rather than because of their objective health state.

A second reason proposed to account for why older individuals rate their health as better than younger individuals relates to reference group theory (Kelly, 1968). According to this theory, people's actions and expectations tend to reflect the norms of those groups of which they consider themselves to be a part, or wish to be a part. Cockerham (1983) proposed that a likely explanation for "health optimism" in older individuals stems from how they compare themselves with peers of their own age, sex and perhaps expectations others have of their health. Thus as Tornstam (1975) states:

> One's own aches and pains generate a rather poor subjective health status if one compares one's health with healthier individuals; it generates a rather good subjective health status if the reference group is composed of individuals suffering from still worse aches and pains. (pg 267)

Such a proposal, however, is as yet untested. An extensive review of the subjective health literature reveals that no researchers have required that their subjects distinguish between global subjective health and subjective health which is age-related, when making assessments of their health.

Research has generally found elderly males to give more subjective assessments of good health, than elderly females of the same objective health status (Maddox,1962,1964; Shanas et al, 1968; Maddox & Douglass, 1974; Brown & Rawlinson, 1976), although a few studies have recently reported contrary findings (Garrity et al, 1978; Blazer & Houpt, 1979; Ferraro, 1980).

While elderly males have been found to be optimistic about their health, elderly females have been found to be pessimistic (Maddox, 1964). Cavan et al (1949) in their research, reported that for every subjective measure of health they used, women in their early sixties indicated poorer health than did the men. Overall fewer women believed their health was good; fewer felt satisfied with their health and fewer still reported a lack of any illness.

Maddox (1962,1964) suggested that two reasons could account for the association between sex, optimism and health. Maddox (1962) firstly reasoned that while the mortality rate of older persons favours women, women in their middle years and at the beginning of old age are more likely than men to report illnesses which restrict their activity and result in bed disability. Secondly in our society males are expected to be stronger than females and this expectation may be reflected in the tendancy of males to deny poor health (Maddox, 1964).

Race and culture has also been found to be associated with subjective health estimates in the elderly. Generally it has been found that those races and cultures which could be considered currently "disadvantaged" in some way, subjectively assess their health to be poorer than races and cultures which would be considered currently "advantaged". This relationship has often been found to hold true

regardless of the objective health status of the subjects studied.

Tessler & Mechanic (1978) found in their study that subjective health assessments of poor health were significantly affected by black status. Maddox (1962) similarly reported positive but not statistically significant associations between self-ratings of good health and being white. Finally Wan (1976) reported that more blacks than whites perceived their health as being worse than that of others their own age.

Linn et al (1980) investigated the relationship between subjective health assessments, disability and impairment in 174 individuals aged 65 and over, representing three different cultures: Anglo, black and Hispanic (Cuban). Subjects in this study were asked to indicate what they considered their current health to be, on a 5-point scale ranging from (1) very good to (5) very poor. Disability was measured using the Rapid Disability Rating Scale which rates the degree of assistance needed in activities of daily living. Impairment was measured on the Cumulative Illness Rating Scale (CIRS) which rates the severity of impairment to thirteen bodily systems.

Linn et al (1980) found that although the objective health ratings were significantly higher for the Cubans compared to blacks or Anglos, they subjectively assessed their health as significantly worse than did the two other cultural groups.

Kutner et al (1956) found that elderly people born in the United States, Germany, Austria, Britain and to some extent Ireland, functioned as "health optimists", while those elderly born in Czechoslovakia, Hungary, Poland and Italy functioned as "health pessimists". Few of the former were found to subjectively assess their health as poor and few worried about their health. Kutner et al (1956) found that while not a single elderly British subject rated his or herself in poor health, if in good objective health, about thirty percent of the Italians, forty percent of the Czechs, fifty percent of the Polish and fifty percent of the Hungarian elderly assessed themselves as in poor health, even though they were objectively in good health.

Williams (1983) research on culture and concepts of health status

may partially explain the above findings. Williams (1983) found that the concept of "functional fitness" varied according to the nationality of the perceiver. In Scotland "fitness" is viewed as freedom from disabling disease. In France, however, "fitness" is regarded as dependent not only upon freedom from disease but also upon physical strength. Thus differing cultural concepts of health may well be reflected in the above research.

Finally education level, socioeconomic status and work role status have also been found to be associated with subjective assessments of health in the elderly.

In general, researchers have found that the more education an elderly individual has the more likely it is that he or she will perceive and assess his or her health as positive (Tessler & Mechanic, 1978; Ferraro, 1980; Cockerham, 1983; Wan, 1976). Wan (1976), for example, found that the distribution of persons who subjectively assessed their health as poor to be monotonic by educational level, with the highest rate amongst those elderly who had never attended school and lowest among those with six or more years of university education.

Cockerham (1983) suggests that this relationship exists because those with more education feel their social environment is more conducive to maintaining good health than that of less educated groups.

Researchers have also found that those elderly of a higher socioeconomic level tend to judge themselves as being in better health than do those in the lower socioeconomic levels, whether in good objective health or poor objective health (Kutner et al, 1956; Figa-Talamanca, 1976; Heyman & Jeffers, 1963; Blazer & Houpt, 1979; Linn et al, 1980).

Figa-Talamanca (1976) found that the subjective health assessments of elderly Italians in her study varied considerably from one zone of the city examined, to the other. The elderly of Area 1, who were the most disadvantaged from a residential, economic and social point of view, were found to report good health less frequently than those of Area 3, the most prosporous of the city. Overall her findings indicated that subjective health assessments of poor health were

more common among elderly living in less affluent sections of the city and among those of the working class. Kutner et al (1956) found that although the number of cases was small, their data suggested that higher socioeconomic status elderly tended to function as "health optimists", while those of a lower socioeconomic status functioned more as "health realist". Kutner et al (1956) suggested that this was because upper economic groups tend to deny health deterioration compared to lower economic groups.

Employment status, previous work status and the degree of work role change an individual has had in his or her life time has been found to be significantly related to subjective assessments of health.

Wan (1976) found that being employed versus not being employed was only one of two non-sociomedical indicators that proved predictive of age-related subjective assessments of good health.

Investigators have also found subjective assessments of health to vary according to previous and current work experience. Generally elderly who have been white collar workers, have been found to assess their health as good more often than those who were blue collar workers (Maddox, 1962,1964; Figa-Talamanca, 1976). Heyman & Jeffer's (1963) reported that over a period of three years, subjective health assessments of manual elderly workers tended to be in the direction of poorer health, while for non-manual elderly workers, subjective assessments of health tended to remain stationary.

Maddox (1962) noted a relationship between subjective good health and degree of change in work roles, in the elderly. Overall a positive but not statistically significant relationship was found between subjective assessments of good health and having experienced minimal change in work roles over a lifetime. This relationship was found to exist regardless of the objective health of the elderly subject.

More recent research has demonstrated the usefulness of subjective health assessments as predictors of later adjustment to an illness.

Garrity (1973) investigated activity levels and social involvement

in 62 males aged 32-74 who had just suffered their first myocardial infarction (heart attack). In addition to the above variables, subjective health was measured by means of a Cantril Ladder (Cantril, 1965). This measure asked the patient to rate his health on a ladder which ranged from "worst possible" at the low end to "best possible" health at the high end. Two clinical measures of objective health were obtained from the patient's hospital records: 1) the absence or presence of chronic health problems and 2) the severity of the initial heart attack as measured by a cardiogram. Garrity et al (1973) found subjective health assessments at six months following the heart attack to be far more strongly associated with return to gainful employment than the measures of activity and social involvement, even after the influence of all of the clinical measures of health had been held constant.

In a later study, Garrity et al (1978) found that subjective assessments of health for patients with myocardial infarctions were significantly associated with post-attack levels of morale as well as with return to employment after hospitalisation. Brown and Rawlinson (1976) found the morale of patients following open-heart surgery, related also to subjective health assessments.

Finally research has investigated the potential of using subjective assessments of health as predictors of longevity and mortality. Researchers, noting the protective effect subjective health assessments appeared to exert in studies of adjustment to illness, became interested in the potential qualities subjective assessments of health could exert with regard to longevity and mortality.

The effect of subjective health assessments on longevity, which is defined as the length of time an individual can live under the most favourable of conditions was investigated by Pfeiffer (1970) and LaRue (1979). In a comparison of short and long-lived men Pfeiffer (1970) reported that self-ratings of health were predictive of length of survival, but that physicians ratings based upon medical records were correlated with length of survival only in the case of male subjects. While the majority of long-lived men rated their health as good, the same was not true for short-lived men. In three out

of the four health measures used, the short-lived men rated their health as significantly poorer than did the long-lived men. LaRue et al (1979) found that while self-reports of health and physicians' ratings were predictive of differences in survival time among younger subjects (77-84), neither were significantly related to longevity for older subjects (85-93).

More conclusive evidence with regards the relationship between subjective assessments of health and mortality have been found. Singer et al's (1976) study examined the effect of mental health, as rated by two psychiatrists in 1954 on the basis of a series of responses to a standardised questionnaire, and other factors on 1) the probability of dying during the next 20 years, 2) cause of death and 3) age at death. Subjects for this study were 1124 survivors of an original sample of 1660 individuals aged 20-59 who took part in the Midtown Manhatten Study in 1954. Subjective health was measured on a four-point scale which ranged from (1) poor to (4) excellent health. Other variables assessed included obesity, alcohol consumption, smoking, sex, age, marital status, education, heart condition, blood pressure, mental health, country of birth and rural/urban location in childhood. Singer et al (1976) found that of a series of potential psychological predictors of mortality examined, only the respondent's subjective assessment of his or her health significantly predicted the probability of dying within the next 20 years. Overall subjective health ratings were found, aside from sex and age to be the most powerful predictor of mortality amongst the variables Singer et al (1976) examined.

Mossey and Shapiro (1982) also investigated subjective health assessment as a potential predictor of mortality. Subjects for their study were a random sample of 3,128 non-institutionalised individuals aged 65 years and over in 1971. Advantages of this study over that of Singer et al (1976) was the installation of controls for the subject's objective health status. "Specific" subjective health assessment was defined by responses to the question: "For your age would you say, in general, your health is excellent, good, fair, poor or bad?". Objective health status was defined as a function of the type and seriousness of conditions reported by a physician. Scores ranged from (0) no reported health problems to (23) many reported and serious health problems.

Mortality was assessed for two time periods; early mortality (1971-1973) and late mortality (1974-1977). Variables in addition to subjective health, included age, sex, and other sociodemographic variables such as marital status, monthly income etc. Also assessed was the L.S.I.; a measure of life satisfaction.

Mossey and Shapiro (1982) found substantial evidence in support of the hypothesis that subjective health assessment is related to mortality, independent of the subject's level of objective health status. Of the variables studied, subjective health assessments were found second only to age as a predictor of early mortality and in terms of late mortality, it was found to be the strongest predictor. Mossey and Shapiro (1982) found also that "health pessimists" had a slightly higher chance of dying than those who were in objectively poorer health but who were optimistic in their subjective assessments of personal health status.

One explanation for this relationship between subjective health assessments and mortality is that subjective health assessments are sensitive and possibly more sensitive to impending health changes than are objective health assessments. Evidence to support this theory can be seen in Maddox & Douglass's (1974) study. Maddox & Douglass (1974) found that an individual's subjective health assessment was a better predictor of a subsequent physician's rating, than was a current physician's rating of that individuals objective health. A second explanation and one that will be investigated in this study is that factors, such as personality may have an influencing and protective effect, which is reflected in self-rated health. Mossey and Shapiro (1982), for example, indirectly implicate the potential role of self-esteem in one of their reasons for their research findings:

> It may be also that positive health ratings-even if discordant with objective ratings-are protective because positive, optimistic feelings, in themselves, are protective. (pg 805)

Summary

In summation, subjective health is an individual's perception of his or her health status, of which two types; "global" and "specific" can be identified. A subjective assessment of health refers to an overt measurement of an individual's subjective health.

Research into an individual's subjective health assessments has revealed the existance of a number of consistent relationships. Objective health status has been found to be significantly and positively related to subjective assessments of health but the relationship is not one of great magnitude. Subjective assessments of health have been found to be reliable over time and to over-estimate the favourableness of an individuals objective health state. Non-medical factors are also related to subjective health but generally not to the degree of objective health. Subjective assessments of good health has been found to be associated with positive attributes while subjective assessments of poor health have been found to be associated with negative attributes.

CHAPTER IV

SELF-ESTEEM AND LOCUS OF CONTROL

This chapter will focus on the two personality variables, self-esteem and locus of control. Each personality variable will firstly be defined and discussed in terms of it's historical significance to psychological research. The importance self-esteem and locus of control have for the elderly will then be outlined. Finally self-esteem and locus of control will be examined as potential moderators able to explain the relationship between objective health and subjective health assessment in the elderly.

Self-esteem

Although there is no standard operational or theoretical definition of self-esteem, self-esteem is usually defined as the degree of liking or disliking an individual has for him or herself. As such self-esteem is also known as the perception of self-worth.

Coopersmith (1967) in a well known definition of self-esteem states:

> Self-esteem is the evaluation which the individual makes and customarily maintains with regard to himself; it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable and worthy. In short, self-esteem is a personal judgement of worthiness that is expressed in the attitudes the individual holds toward himself.
>
> (pg 7)

Self-esteem is often confused with the term self-concept. Self-esteem differs from self-concept in that self-esteem refers to the positiveness or negativeness of one's self-evaluation. Self-concept on the other hand, is a broader term involving an individuals total perception of his or her personal characteristics and abilities as well as his or her relationships with others, the environment and his or her personal goals.

Much theorising concerning an individual's self, self-concept and self-esteem arose from the work of the early personality theorists. Although it is beyond the scope of this thesis to outline in depth the contribution each theorist made, brief mention will be made of some milestones which ultimately shaped our current perspectives of self-esteem. One self-esteem theory, that of Coopersmith (1967) will then be outlined and research from one of his studies presented as an indication of the potential importance self-esteem has as a personality variable.

Alfred Adler (1927) was the first to draw attention to self-esteem as a major construct in personality theory. In his explanation of neurosis, Adler repeatedly emphasised the neurotic's concern with loss of self-esteem (inferiority complex) and his or her strivings for superiority. Horney (1945) emphasised more than anyone before her the conflict between self and others and the role a neurotic's cognitive processes played in guarding against a loss of self-esteem. Finally Sullivan (1953) proposed an important model explaining the maintenance or extension of an individual's self-esteem during his or her lifetime.

Coopersmith's (1967) self-esteem theory suggests a model of how self-esteem is aquired and what components make up an individual's self-esteem. Coopersmith (1967) proposes that the major influences on an individual's self-esteem are largely outside the control of the individual. In particular Coopersmith (1967) suggests that influences on self-esteem begin in childhood with the actions of parents and continue into adulthood with the responses of peers and significant reference groups. Coopersmith (1967) in a number of related studies found three separate factors leading to the development of high self-esteem; namely 1) parental acceptance of children 2) clearly defined and enforced limits on behaviour and 3) respect for individual action within those prescribed limits. These he found provide the base for four determinants of self-esteem: competence, significance, ethical or religious virtue and power.

In a study of self-esteem and anxiety in preadolescent boys

Coopersmith (1967) found that those individuals who differed with regard to self-esteem level, also differed with regard to their personality and behaviour. In particular those with high self-esteem were found to be more confident, accepting of their own opinions, courageous, socially independent, creative and assertive compared to those individuals who exhibited low self-esteem. Coopersmith (1967) concluded that self-esteem was important in two ways:

> Self-esteem has consequences that vitally affect the manner in which [an individual] responds to [him or herself] and [to] the outside world.(pg 71).

Locus of control

Locus of control is defined as the belief an individual holds that events in his or her life are under his or her control and contingent upon his or her behaviour, or alternately under the control of others (Rotter, 1966)

The locus of control concept in its present form developed out of a general dissatisfaction with Skinnerian explanations of human behaviour. Basically Skinner proposed that all individual behaviour can be classified as responses to stimuli in the environment and if these responses are reinforced, then the individual will perform the behaviour again. Rotter (1954), however, believed that Skinner's explanation of human behaviour was inadequate and proposed an alternative known as social learning theory.

Rotter (1975) argued that the probability an individual will engage in a certain behaviour is affected by two factors. The first of these is "expectancy", or the individual's perception as to whether his or her behaviour will produce some reinforcement. The second factor is the perceived value of the reinforcement. Rotter proposed that two classes of variables determine expectancy. One of these are cues an individual receives about a situation. The other concerns the individual's estimate of the success he or she will have in reaching a particular goal. One such estimate concerns whether an individual believes his or her reinforcers are controlled by his or her own behaviour or by factors beyond his or her control. This expectancy

Rotter (1966) labelled locus of control.

Under Rotter's (1966) theory an internally controlled person perceives events as consequences of his or her own actions and under his or her own control. Typically an internal locus of control personality will show evidence that he or she sees outcomes of events as his or her responsibility and will generally take action effecting positive outcomes. An externally controlled person, on the other hand, will generally perceive events as beyond his or her control, and due to either others or chance. An external locus of control personality will talk about fate, external circumstances, or other people determining what happens to them. He or she will generally take little or no action effecting positive outcomes.

The first locus of control scale was introduced by Phares (1957). This scale was later revised by James (1957, cited by Rotter, 1966) and revised again by Rotter (1966). The final product, the Internal-External Control of Reinforcement (I-E) Scale (Rotter, 1966) measures the degree to which a person attributes expectancy that reinforcements (or events) are contingent upon one's own behaviour. Much research concerning locus of control has been based on Rotter's (1966) I-E Scale.

Reviews classifying and describing the large amount of research based upon the I-E construct have been published (Lefcourt, 1966; Joe, 1971). These reviews generally indicate that an individual who believes reinforcements are controlled by internal rather than external forces is likely to; make greater attempts at mastering his or her environment, be more successful in adjustment, obtain greater satisfaction with present and past life accomplishments, be more resistent to attempts to influence by others, be more effective in influencing others, to prefer high probability choices in risk-taking, be acheivement oriented and finally to be more involved in social action (Lefcourt, 1966; Rotter, 1966; Joe, 1971).

Self-esteem and the elderly

Investigations of self-esteem in the elderly have typically

focussed on two areas; namely the relationship of self-esteem to work roles and the relationship of self-esteem to institutionalisation. Results have shown that an important aspect of self-esteem which appears linked to both work and institutional care is the degree to which an elderly individual is in control of his or her life (Lieberman & Lakin, 1963).

Typically research has found that a loss of self-esteem often precedes the admittance of an elderly individual to an institution (Anderson, 1960) while self-esteem also appears to be related to the degree of productivity an elderly individual is capable of (Gubrium, 1963).

Surprisingly little research has focused on overall self-esteem and its relationship to chronological age (Wylie, 1979). One explanation for this, noted by Hunter et al (1982) is that most studies of the elderly have focused upon the effects and relationships of well-being and life satisfaction. However indications are that self-esteem also has an important relationship to the elderly, albeit a little researched one.

One important study that does investigate self-esteem as a function of chronological age is that of Hunter et al (1982). Hunter et al (1982) studied the background and personality characteritics associated with low and high self-esteem in the elderly. Subjects were 250 men and women aged 65 years and older. Self-esteem was measured by three scales: the Rosenberg's Self-esteem Scale, Coopersmith's Self-esteem Inventory and Bown's Self-report Inventory. Variables measured included age, education, income per week, presence of a spouse, subjective assessment of health, self-rated pain, disability and total number of medications.

Elderly individuals with either high or low self-esteem were not found to differ with respect to age, income, education or living arrangement. However the high and low self-esteem elderly could easily be discriminated with respect to the other variables measured. In general it was found, as in Coopersmith's (1967) study that high self-esteem was attributed to positive attributes while low self-

esteem was associated with negative attributes. Specifically the low self-esteem elderly reported at a statistically significant level more daily pain, greater disability and interestingly poorer subjective assessments of health. Elderly with low self-esteem were also found to report more somatisation, more anxiety, more depression and a greater external locus of control both with and without the health variables controlled.

Hunter et al (1982) concluded that self-esteem was indeed a fundemental concept in an elderly person's life.

Busse (1954) in a report dealing with depressive episodes in both young adults and the elderly, also argued for self-esteem as an important controlling factor in the elderly. He concluded that the mechanisms underlying depression in elderly persons can be distinguished from those of younger adults on the basis of self-esteem. While he saw depression of younger adults as the turning inward of unconscious impulses which are unacceptable to the ego, depression in the elderly was usually related to the loss of self-esteem. His conclusion was that elderly persons on whole have been removed from situations in which they would have the opportunity to demonstrate their self-worth.

Locus of control and the elderly

An elderly individual's expectancy of control has also been found to be a significant factor in aging, especially with regards to life satisfaction, morale and adjustment. The following studies focus on research into the locus of control of elderly individuals in community settings.

Palmore and Luikart (1972) as previously noted, examined the correlates of life satisfaction in the elderly. Variables in the study in additon to life satisfaction included internal-external locus of control. They found that for the total group (age 45-69), that I-E was the third strongest correlate of life satisfaction. Among the 60-71 age group, internal control was the second best predictor of life satisfaction next to subjective assessments of health status.

Kuypers (1972) studied 64 subjects with a mean age of 67.7 years who responded to a mail request to fill out the 10 item Rotter's I-E Scale. Two trained clinical psychologists rated each subject on 30 ego processes and personality characteristics. Elderly persons who scored an internal locus of control were found to possess greater activity, differentiation, complexity and adaptability. It was suggested by Kuypers (1972) that the personal control dimension may be one context against which events are interpreted and experienced by the elderly person in his or her adaptation to his or her environment.

Levinson (1975) examined the correlates of internal-external control in an interview survey of 200 randomly chosen elderly aged 65 years and over living in the community. Various measures such as the I-E Scale, health, religious participation, educational level, former occupation, quality of housing, activities, number of social contacts and degree of happiness were included. Correlations between the variables were found to be highly significant and supported the hypothesis that an external locus of control oreintation was positively related to greater stress, misery and alienation, while internal locus of control was associated with an absence of these characteristics.

Research into locus of control has also focused on the institutionalised elderly. Focus has been made on this group in an effort to study those who have been denied the opportunity to exercise personal control.

In one of these studies (Langer & Rodin, 1976), 91 institutionalised adults, of which 17 were male and 74 were female, were given a "control enhancement" treatment in order to determine whether physical, behavioural and psychological deficits manifested during aging are environmentally determined, and as such reversible. Two groups of nursing home residents were used. One group was told by the nursing home director that they were capable of and should be making decisions they used to make themselves before admittance to the nursing home. They were then given some decisions to make and plants to be responsible for. The second group were given a different kind of communication. The nursing home director stressed to this group the staff's eagerness to take care for them. Both groups were identical with respect to pretest measures of psychological and physical health. In post-

treatment measures taken three weeks later the responsibility-encouraged group showed significant improvements over the comparison group on measures of alertness, happiness, active participation, and a general sense of well-being.

A followup study was conducted by Rodin & Langer (1977) 18 months later to determine whether there were continued positive effects of that intervention. At this time it was found that approximately half as many people in the experimental group, compared with the comparison group, had died. In addition, of the survivors, those in the responsibility encouraged group were significantly superior to the comparison group on measures of physical and psychological health.

Self-esteem and locus of control as moderating variables

Self-esteem and locus of control while conceptually distinct have been found to be moderately correlated (-.24 to -.30). In general those with high self-esteem also tend to have an internal locus of control (Reid et al, 1977).

Due to self-esteem's theoretical base in childhood (Coopersmith, 1967) and locus of control's existance as an individual trait or characteristic rather than a transient state, each may be seen as potentially powerful and enduring personality variables. In this study it is proposed that these personality variables may determine or influence in some way the health perceptions of an elderly individual.

In the literature some support has been found for personality functioning as a moderating variable. Originally research into this area was prompted by researchers noting large individual variation in reactions to objective life events. Lefcourt (1980), for example, noted:

> While some individuals appear ready to succumb to the slightest of lifes challenges, there are others who display great fortitude in encounters with tragic and horrifying circumstances. (pg 201)

Two researchers Antonovosky (1979) and Korbasa and her colleagues have focused on the potential moderating effect an individuals personality may have on the relationship between stress and objective health outcomes.

Antonovosky (1979) theorised that certain individuals possessed a personality structure that he called "sense of coherence" which enabled them to stay in good objective health when faced with extremely stressful situations. Those without a "sense of coherence" were susceptible to poor objective health when faced with stress.

Kobasa (1979) renamed Antonovosky's (1979) "sense of coherence", "hardiness". To Kobasa (1979) "hardiness" intergrated three personality characteristics 1) a belief in the ability to control or influence events of their experience 2) an ability to feel deeply involved in or committed to the activities of their lives and 3) the anticipation of change as a challenge to further development.

Kobasa, Maddi and Kahn (1982) in an alternative analysis of an earlier study investigated the hypothesis that "hardiness" acts to decrease the effects of stress events causing illness. In this study stress and "hardiness" were found to interact, suggesting the importance of personality in moderating between stress and illness as measured by the Seriousness of Illness Rating Scale.

Summary

To summarise, self-esteem refers to an individuals perception of self-worth while locus of control refers to an individuals belief in either internal control of events in the world or external control of life events. Both of these personality variables have been found to be important in determining a variety of outcomes in the elderly. In particular, high self-esteem has been found to be associated with positive outcomes in the elderly while external locus of control has been found to be associated with negative outcomes. Previous research in health supports personality variables moderating objective outcomes.

CHAPTER V

THEORY AND HYPOTHESIS

Evidence from the literature reviewed up to this point suggests the existence of a number of relationships.

Firstly an individual's objective health enjoys a positive and consistent, but not overly strong relationship to subjective health assessments in the elderly. Secondly non-medical factors have also been found to be associated with subjective assessments of health in the elderly, though not to the same degree as objective health. These non-medical factors appear to show a consistent pattern in their association with subjective health in the elderly. Thus good subjective health in the elderly is associated with being a well educated and adjusted older white male, who lives in a dominant culture, possesses high socio-economic and work role status and who enjoys good psychological and psycho-physiological health. This individual is likely to recover well from illness and live longer than the average elderly person. Poor subjective health in the elderly, on the other hand is associated with the absence of these characteristics.

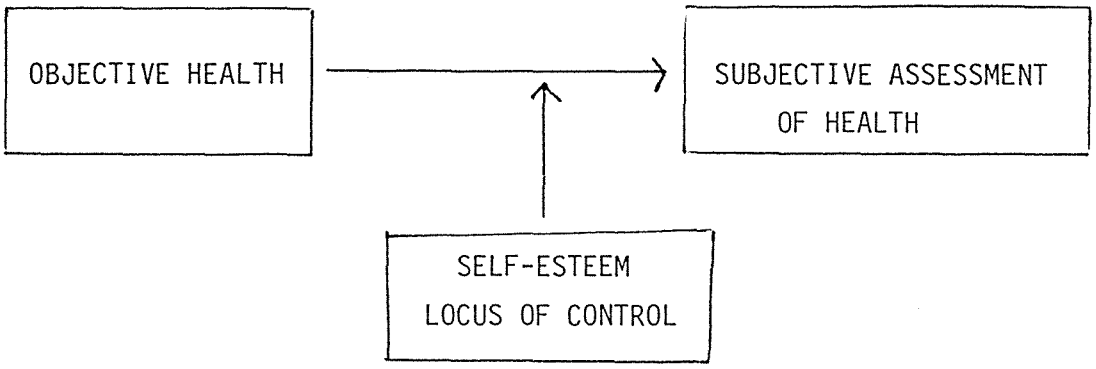
It is suggested in this study that the personality variables, self-esteem and locus of control may well account for the above relationships between objective health and subjective health. Thus an individual who is well educated and of a higher socioeconomic status is more likely to be internally oreinted and possess high self-esteem than someone who is not.

When he or she rates his or her health it is possible that personality moderates the resulting assessment.

The model proposed here calls for an examination of the relationship between objective health and subjective assessments of health. In the model, self-esteem and locus of control is viewed as moderating

the effects of an individual's objective health, and thereby producing subjective assessments of health. A diagramatic representation of the model is presented in Figure 1.

FIGURE 1: DIAGRAMATIC REPRESENTATION OF THE MODEL



To explore the model the following hypothesis will be tested:

Hypothesis- Each of the two personality varaiables, self-esteem and locus of control will interact with objective health to moderate between objective health and subjective health in the elderly.

CHAPTER VI

METHOD

The Sample

The sample consisted of 102 subjects who met the following criteria for selection:

1) Were 60 years of age or over as of their last birthdate at the time of the interview.

2) Were physically capable of participating in an interview that took approximately an hour to administer, and

3) Were mentally capable of participating in the interview. "Mentally capable" was defined as the subjects ability to understand and respond appropriately to items contained in the interview questionnaire.

The subjects were drawn from seven residences for the elderly. Four of these were situated in Wanganui and three were situated in Palmerston North. The nature of these residences ranged from a geriatric hospital, which provided short term institutional care to home units designed especially for the elderly and which provided for long term independent living. In total 120 individuals were approached by the researcher. 51 of these individuals were chosen as potential subjects for this study by nursing staff, while 69 were visited by the researcher. Of these 120 individuals, 106 agreed to participate in the study. The 14 individuals who did not agree to participation constituted a refusal rate of 11.6% and included those who declined due to physical tiredness, those who had other engagements at the time, or those who were simply uninterested in participating. Of the remaining 106 subjects, a further 4 were eliminated from the sample because they failed to meet the selection criteria noted above. 3 of these were judges to be unable to concentrate on or fully understand the interview material and one was

profoundly deaf so as to make meaningful communication impossible.

Demographic Information

The subjects ranged in age from 60 to 94, with a mean age of 75. Demographic information is presented in detail in Table 1. Of the 102 subjects, 25 were male (24.5%) and 77 were female (76.5%). The higher percentage of females in the sample reflects the greater longevity of elderly females compared to elderly males and also the relative distribution of males and females found in institutional care and housing designed for the elderly. With regard to residential status, 59 (57.8%) of the sample resided in their own flat or home unit, 21 (20.5%) were living in old age homes, 13 (12.7%) were in a nursing home and 9 (8.8%) were in a geriatric hospital. Of the total sample, 59 (57.8%) were living independently in the community while the remaining 43 (42.1%) were under some form of institutional care.

Procedure

Pilot Study

A pilot study was carried out prior to the main study for the purposes of 1) testing the clarity and suitability of the items contained in the research questionnaire 2) assessing the effect of the questionnaires length on elderly subjects and 3) determining the best means of administering the questionnaire items to elderly subjects.

A total of eight subjects participated in the pilot study and met the same criteria for selection as the main study sample. Four of the pilot study sample were from one of the old age homes used in the main study, and four were from home units separate from but similar to those home units visited in the main study. Those subjects in the old age home were administered the questionnaire by means of a structured interview. Those subjects in their own homes self-completed the questionnaire. None of the pilot study sample were included in the main study.

As a result of the pilot testing, changes were made to the wording of some questionnaire items. These changes were designed to increase

TABLE 1 : AGE, SEX, RESIDENTIAL, AND LIVING STATUS OF RESPONDENTS

	N	%
AGE GROUP		
60 - 64	13	12.7
65 - 69	16	15.7
70 - 74	17	16.7
75 - 79	22	21.6
80 - 84	20	19.6
85 and over	14	13.7
SEX		
Males	25	24.5
Females	77	75.5
RESIDENTIAL STATUS		
Hospital	9	8.8
Nursing Home	13	12.7
Aged Home	21	20.5
Own Unit	59	57.8
LIVING STATUS		
Under Care	43	42.1
Independent	59	57.8

item clarity and facilitate a conversational flow throughout the questionnaire. The latter of these two changes was made in lieu of the decision to verbally administer the questionnaire in the main study, rather than have the respondents self-complete it. It was felt that the validity of the responses would be greater when the questionnaire was verbally administered and also the problem of poor return rates would be eliminated.

Two methods of verbally administering the questionnaire were tested during the pilot study. The first involved simply reading to the subject each item in the questionnaire. The second involved reading to the subject only those questionnaire items involving a simple "yes-no" or "like me-unlike me" response, while other questionnaire items that were longer or more abstract were presented to the subject on cards. It was found that the second method of administration offered the most advantages, by aiding communication with subjects who had hearing problems and also allowing the subjects greater concentration on the task at hand.

As a result of pilot testing changes were also made to the number and structure of some items in the questionnaire. In particular the 30 item Locus of Control Scale was found to be lengthy and some items in it too abstract for those of the pilot sample in poor physical health. Accordingly, for the main study, the number of items in this scale were reduced and the responses options changed. Details of the changes made to the Locus of Control Scale can be found in the section outlining the personality measures used in this study.

Data Collection

Data for the main study was collected over a period of 4 months, from July 1984 to November 1984. The data collection procedure was the same for all respondents, with some minor variation necessary to accommodate subjects under care and subjects living independently in the community. These will be outlined below.

Summary of Procedures

1. The subjects were obtained from seven preselected residences for the elderly. Four of these were situated in Wanganui and three were situated in Palmerston North. The criteria for preselection of the residences was based upon the need to obtain elderly persons in varying states of health. For statistical reasons a wide health range is considered optimal for revealing the existence of a relationship between health and target variables (Riegal, Riegal, & Meyer, 1968). As such each residence was chosen for its likelihood in containing elderly residents of a certain health status. Varying types of residences, and those in two communities were furthermore chosen in order to more fully tap the wide range of health states existing amongst the elderly.

2. Access to subjects in the geriatric hospital was gained through the Medical Superintendent and the Principal Nurse of the institution. Access to subjects in the nursing home and old age homes was gained through the Principal Nurse and/or Matron of the respective institution. Access to subjects not under institutional care was gained through the controlling bodies which administered the housing complexes selected for study. Each official of each respective institution or controlling body was seen individually by the researcher and presented with a letter from the project supervisor which outlined 1) the nature of the study 2) the research protocol and 3) the estimated amount of time required for the study (See Appendix A). A copy of the questionnaire was also made available for examination and comment. The researcher then met staff of the respective institutions and explained the nature of the study to them. Staff were advised of the selection criteria and shown some of the more abstract items in the questionnaire. From these the staff were asked to select the residents they thought were suitable for participation in the study.

3. All of the subjects under institutional care, who had been selected by staff, were approached individually by the researcher. The

researcher introduced himself as being interested in the health and attitudes of persons 60 years of age and over. The subjects were asked if they wished to participate in a study investigating these factors. If so, they were then asked to sign a consent form which outlined the safeguards established in the study for anonymity and voluntary participation (See Appendix B). The residents who agreed to participation were interviewed individually and privately.

Those subjects living independently in home units were sent a letter of introduction from the researcher (See Appendix C). This letter requested the residents participation, stressed the confidential nature of the study and advised that the researcher would be calling in the near future. It was thought that greater cooperation would result if these subjects had prior knowledge of the study and its purpose. Each home unit was approached during day time hours on weekdays. Those residents who agreed to participation were also interviewed individually and privately.

In the interview the questionnaire items were read aloud while selected items were additionally presented on cards. Each item was presented in the order it appears in the study questionnaire. Respondents answers were recorded on individual booklet forms at the time of the interview.

4. Upon completion of the interview respondents were thanked and given an opportunity to ask questions. If interest was shown details of the study were explained more fully.

Survey Content

The format of the survey questionnaire was designed so that it could be either self-completed by a respondent or used in an interview. In the main study the questionnaire was presented by means of an interview. The questionnaire material was designed to obtain measures in three main catergories: 1) subjective health, 2) objective health and 3) personality. A measure of well-being was also included

in the questionnaire for future research purposes. Demographic data measures were additionally included in the questionnaire.

The 22 page booklet which was titled "Health and Attitude Survey" was arranged with the measure Subjective Health C first, followed by Subjective Health A, Subjective Health B, Life 1, Seriousness of Illness, Health History, Functional Limitations, Locus of Control, and Self-esteem measures. The last page requested demographic information and thanked the respondent for participation. The arrangement of the items was designed to 1) satisfy theoretical requirements of the study 2) aid item continuity and 3) reduce test fatigue. Instructions for self-completion were printed on the front cover. (The questionnaire is presented in Appendix D).

The rationale for each of the measures contained in the questionnaire will be given below.

1. Subjective Health Measures

The single item measure, Subjective Health A was included as a global measure of subjective health. This measure asked respondents to rate their current health, compared to a person in excellent health, on a seven-point scale ranging from "Terrible" to "Excellent". The ease of administration and relative simplicity of Subjective Health A made it an appropriate measure for use with an elderly population.

The single item measure, Subjective Health C was included as a "specific" or non-global measure of subjective health. This measure asked respondents to rate their current health, relative to others their own age, on a seven-point scale also ranging from "Terrible" to "Excellent". As such Subjective Health C was designed to assess an individuals perception of his or her health relevant to others in his or her age group.

Measures similar to Subjective Health A and Subjective Health C have been used successfully in previous research investigating subjective health (LaRue et al, 1979; Wan, 1976). A modification made in this study to the original form of these measures was the

expansion of the response scale from the traditional four or five-points to seven-points. This allowed the establishment of a midrating of subjective health, "Fair", and also allowed a finer discrimination of subjective health to be made. As a consequence of this modification, the definitive,-"Terrible" (health), was made the response opposite of "Excellent" (health).

The single item measure, Subjective Health B was included in the study as a second global measure of subjective health. This global measure differs from Subjective Health A in being "self-anchored" in the respondent's personal concept of what constitutes "Worst" and "Perfect" health. It's scale in addition allowed the making of a finer discrimination rating of subjective health.

Subjective Health B presented respondents with a 10-point scale similar to Cantril's Ladder (Cantril, 1965). The respondents were asked to imagine the top rung of the ladder as representing "Perfect Health" and the bottom rung as representing "Worst Health". Respondents indicated where on the scale their health currently was by marking one of the rungs on the ladder.

Like the other subjective health measures, Subjective Health B also has advantages in simplicity and ease of administration and measures of its type have been used previously (Palmore & Luikart, 1972; Garrity, 1973).

Subjective health measures of all of the above forms have been found to be reliable (Heyman & Jeffers, 1963), and to show low to moderate validity when compared to objective health measures (Maddox, 1964). The low to moderate validity of subjective health measures does not however put in doubt their use here, as the aim of this study was not to use subjective assessments of health as substitutes for objective health measures but instead to investigate the possible components that comprise or influence subjective assessments of health.

2. Objective Health Measures

The Seriousness of Illness Rating Scale (Wyler, Masuda, & Holmes, 1968) was included as a measure of objective health and used to assess

health from the "presence or absence of disease" perspective (Chappell, 1981). The scale consists of 126 rank-ordered diseases commonly seen in medical practice and familiar to the majority of the population. The rank order of the diseases was established by 117 physicians and 141 lay persons who rated the "seriousness" of each disease. The concept of "seriousness" was based upon factors such as the disease's likely prognosis, duration, threat to life, in addition to the degree of disability and discomfort it would cause.

This scale has been used successfully before in studies of illness as well as in studies of stress (cf. Dohrenwend & Dohrenwend, 1974). The scale's comprehensive range of disease types and its ability to provide a "cumulated severity rating" made this measure also appropriate for use in this study.

Two modifications were made to the original form of this scale. Firstly those disease items not appropriate to either a New Zealand or an elderly population, such as "snake-bite", "chicken-pox" etc, were deleted from the scale. The second modification involved including layman's terms to some of the disease items in order to aid the respondent's identification of the disease.

The modified scale, which comprised 91 items, was divided into three sections. The first section asked respondents whether they were currently suffering from one or more of 55 disease items. These disease items were considered able to be easily and accurately self-diagnosed. The second section of the scale asked the respondents whether a doctor or nurse had told them that they were suffering from one or more of 26 additional disease items. The second section was phrased differently from the first in order to ensure that the more serious and less overt diseases were reported accurately. Evidence from the literature suggests that the elderly are not always accurate reporters of symptomology (Kutner et al, 1956). In the final section 10 disease items that were more accurately assessed by means of detailed questions, were presented to the respondent. The response choices for all items in the scale were "Yes" and "No".

Wyler, Masuda and Holmes (1971) tested the "reproducibility" of the Seriousness of Illness Rating Scale, by administering the disease items to two different physician samples to rank. Spearman's rank-order correlation coefficient on the ordering of the disease items was .98 indicating high agreement as to the relative "seriousness" rating given to each disease item. Kobasa, Maddi and Courington (1981) tested the validity of the scale by comparing the medical records of 48 executives with their self-reports on the scale. With regard to the 114 diseases examined, agreement ranged from 82% to 93% suggesting high validity for the scale as a measure of objective health.

"Number of Symptoms" and "Symptom Severity" were two measures derived from the scale and used in this study.

The Functional Limitations Battery (Brook, Ware, Davies-Avery, Stewart, Donald, Rodger, Williams & Johnston, 1979) was included as a further measure of objective health and used in the study to assess health from the perspective of "functional disability" (Chappell, 1981). Based upon the Functional Status Index (F.S.I) (Reynolds et al, 1974), the Functional Limitations Battery consists of measures designed to assess limitations in four areas of functioning. In addition to strong theoretical grounding, the relative ease of administration and the brevity of the Functional Limitations Battery made it appropriate for use with the elderly.

Modifications were made to the form used by Brook et al (1979) and involved a reordering of the presentation of the items and some minor word changes.

The 17 items in the battery asked respondents questions regarding their health related limitations in the areas of self-care, mobility, physical activity and social-role activity. Two response choices: "Yes" and "No" were offered for each item. If respondents answered "Yes" to any limitation, they were then asked how long they had had the particular limitation, with three further response categories provided: "Less than one month", "One to three months" and "More than three months".

Although no measure of validity has been made with regard to the Functional Limitations Battery, an estimate can be deduced from examination of the scale it was derived from. Reynolds et al (1974) tested the validity of the Functional Status Index on 2,629 persons ranging in age from 2 years to 72 years. The F.S.I was found to correlate in the expected directions with age (r= -.59), number of health contacts (r= -.48) and the individuals subjective assessment of his or her health (r= .72).

Four measures: "Self-care limitations", "Physical activity limitations", "Mobility limitations", "Social role activity limitations" and one combined measure: "Functional limitations" were derived from the battery and used in this study.

Health History was included as the third measure of objective health and used in the study to assess each respondents secondary health data. "Secondary health data" is defined here as information regarding the respondent's prior health and other aspects of his or her health, such as current medication, sleeping pattern etc.

Health History was constructed in consultation with a physician. The physician advised on the type and range of questions required to elicit secondary health data. This data was considered by the physician to be essential, in conjunction with other information, for the making of an accurate objective health rating.

The 41 item measure asked respondents information regarding their current appetite, energy and exercise level; their current weight, sleeping pattern and drug regime; their alcohol and smoking history; their stroke and heart attack history and their last four hospitalisations. In addition symptoms and illnesses not otherwise assessed by other objective health measures were included. The responses required for items in Health History ranged from "Yes/No" to answers demanding significant detail. The additional symptom and illness items were incorporated amongst the Seriousness of Illness Rating Scale items in order to promote continuity of the questionnaire format.

The reliability and validity of this measure is untested. Bennett and Ritchie (1975) report however that similar existing measures

are reliable and demonstrate high validity when compared to the information extracted by a physician in a clinical interview.

Two physician's ratings of each respondent were also obtained. These were included in the study as global measures of objective health. These measures assessed in summary form all of the above dimensions of health; namely, the presence or absence of disease, functional status and secondary health data, simultaneously and from a trained medical perspective. The measures were obtained by presenting each respondent's objective health data, as measured by the Seriousness of Illness Rating Scale, the Functional Limitations Battery and Health History, to two physicians to rate. This indirect method of objective health assessment has been used successfully in previous research (LaRue et al, 1979). Although direct assessment of an individual by a physician is considered to be a more objective measure of health status, its utilisation in this study would not have been appropriate because of the possible confounding effect the subject's personality, a focus of this study, may have had on the physician's ratings.

The medical ratings were obtained by presenting two physicians, one a geriatric specialist and the other a general practitioner, with the summarised objective health data of each respondent. This summary was provided on the three page form titled "Health Summary Sheet" (See Appendix E). At the end of the form each physician was asked to rate 1) the respondent's current health status relative to others the respondent's age and 2) the respondent's current health status compared to a person in excellent health. Both of these ratings were made on a seven-point scale ranging from "Terrible" to "Excellent" (health). The criteria used by the physicians to rate each respondent's health status is given in Table 2.

Two measures were obtained from each physician. "Physician 1's Group Rating" and"Physician 2's Group Rating" were measures derived from the first objective health rating (see above). "Physician 1's Global Rating" and "Physician 2's Global Rating" were measures derived from the second objective health rating (also see above). A composite

measure: "Physicians' Rating" was established by combining "Physician 1's Global Rating" and "Physician 2's Global Rating".

TABLE 2: CRITERIA USED BY PHYSICIANS FOR THE RATING OF OBJECTIVE HEALTH STATUS

1 Terrible	Limitation, over 80 percent
2 Very poor	Limitation, 51-80 percent
3 Poor	Limitation, 21-50 percent
4 Fair	Limitation, under 21 percent
5 Good	Disease present. No limitation
6 Very good	No disease or limitation
7 Excellent	"Perfect health"

3. Personality Measures

Self-esteem

Coopersmith's 25 item Self-Esteem Inventory (1967) was included as a measure of self-esteem. This scale is based upon a number of factors which Robinson and Shaver (1973) have isolated and labelled "self-derogation", "leadership-popularity", "parents-family" and "assertiveness-anxiety". Of these, the "family-parents" factor is emphasised by Coopersmith (1967) as the major contributor to an individual's level of self-esteem. Compared to other existing self-esteem measures the Self-Esteem Inventory has the advantages of a shorter length and a simpler form of administration. With some minor word changes the scale is also able to be used with all ages, including the elderly (Robinson & Shaver, 1973).

Modifications to the original scale were made and included the replacement of two age inappropriate items and slight word changes. The age inappropriate items were replaced with items from the longer version of the scale, that were reported to discriminate well between high and low self-esteem (Robinson & Shaver, 1973).

The 25 item measure provided respondents with short statements expressing either positive or negative self-esteem with regard to

"self", family or peers. Respondents answered either "Like Me" or "Unlike Me" to each statement.

No data on the reliability of the 25 item version has been reported, although an estimate can be made from examination of the reliability of the 50 item version of the Self-Esteem Inventory which correlates with the shorter form at over r= .95. Split-half reliability of the 50 item version has been reported at r= .90 with test-retest reliability ranging from r= .70 to r= .88 over a period of 3 years (Robinson & Shaver, 1973). However it is likely that the shorter item version is a less stable measure. The validity of the 25 item version has been tested against other self-esteem measures. A correlation of r= .60 was found with the Rosenberg (1965) scale for college students with other self-esteem measures correlating from r= .42 to r= .66 (Robinson & Shaver, 1973).

Locus of control

The short form version of the James Internal-External Locus of Control Scale (1957, cited in Robinson & Shaver, 1973) was included as a measure of an individuals sense of control. The 11 item scale was derived from the longer 30 item scale by factor analysis (MacDonald & Tseng, 1971) and recommended by Robinson & Shaver (1973) as an alternative to the longer version. Originally the 30 item version was intended for use in this study but was found to be impractical during pilot testing.

James IE Locus of Control scale is based on the concept of internal and external control as described by Rotter (1966), and is reported to have both a simple factor structure and items relevant to both sexes. In addition the scale's items are easily read and understood, although for the population under study no existing locus of control measure was perfectly adequate in this regard.

Modifications made to the 11 item scale included word changes and a reduction of the number of response choices. Word changes were made to make the items age appropriate and the four response choices were reduced to two. This latter modification was made follow-

ing pilot testing, where poor response choice discrimination was found amongst the elderly. A decision was also made to remove one of the 11 items from the short James scale. This decision was made in light of research by Hesketh (1984) who found that the item significantly reduced the alpha coefficients for the short scale from r= .82 to r= .78.

The resulting 10 item measure presented respondents with various statements expressing a belief in external control. Respondents indicated whether they agreed or disagreed with each statement.

The test-retest reliability for the 11 item James Scale was reported by Hesketh (1984) to be r= .90, suggesting a high degree of stability. Validity is not well established for either the short or long James Scale. Robinson & Shaver (1973) report however a correlation of r= .64 between Rotter's IE Scale and the longer version of the James Scale.

Additional Research Measure

Well-Being

Life 1 (Andrews & Withey, 1976), was included as a global measure of well-being. This measure which evaluates well-being from a cognitive perspective has been found by research to be appropriate for use with a New Zealand population (Chamberlain, 1982). Other advantages of the measure, with regard to the population under study, include its ease of use and brevity.

The single item measure asked respondents to rate, on a seven-point scale ranging from "Terrible" to "Delighted", how they currently felt about their life as a whole.

Andrews and Withey (1976) report the reliability of the measure to be r= .70, with its validity compared to other single item well-being measures at r= .80.

CHAPTER VII

RESULTS

The first part of this chapter will describe the scoring of the measures, the treatment of missing data and the selection of variables for analysis. Next the correlation matrix of the variables will be presented and the interrelationships of the variables described. Finally to complete the chapter, the analyses procedures will be discussed and the results of the analyses presented.

Scoring

The scores used in the analysis were established by calculating a total score for each measure in the study. Exceptions were the scores of the measures, Symptom Severity, Self-care limitations, Physical Activity limitations, Mobility limitations, Social Role Activity limitations, Functional limitations and Physicians' Rating.

"Symptom Severity" was a "cumulated severity score" established by totalling the weighting (rank order) of each disease item in the Seriousness of Illness Rating Scale (Wyler et al, 1971).

Each score for the measures, Self-care limitations, Physical Activity limitations, Mobility limitations and Social Role Activity limitations was established according to 1) the severity of each limitation as indicated by an assigned scale level and 2) the length of time each particular limitation had been present. The scale levels for each limitation can be found on the facesheet of the "Health Summary Sheet" (See Appendix F). High scores on these measures indicated the presence of more limitations and limitations over a longer period of time. The score for the measure Functional limitations was a summary indicator of each respondent's functional limitations and was established by calculating the total score of the four limitation measures.

"Physicians' Rating" was a composite (mean score) of "Physician 1's Global Rating" and "Physician 2's Global Rating".

Missing Data

A selective loss of data occurred for 5 (4.1%) of the 102 subjects in the sample. This loss of data resulted from a decision made during the study not to administer the locus of control measure to 5 hospitalised subjects who were in very poor health, on bedrest and susceptible to fatigue. It was felt that the abstract nature of the items in this scale in combination with the additional time required for their administration would be detrimental to the health of these subjects. List wise deletion was used to remove these subjects from consideration in the analysis. As a result subject numbers vary slightly between analyses.

Selection of Variables

To enable the hypothesis to be tested the subjective health, objective health and personality variables were all included in the analyses. The variable "Life 1" was excluded from the analyses because as a measure of well-being it was not focal to the hypothesis. The demographic variables, "Age", "Sex" and "Residential Status" were excluded from the analyses on similar grounds.

Not all of the subjective health and objective health variables were included. "Subjective Health C" was not included on theoretical and practical grounds. Theoretically "Subjective Health C" was not appropriate for inclusion with the other dependent variables because it represented a "specific" rather than global measure of subjective health. Subjective Health C's purpose in the study was also primarily practical. To avoid the respondents taking their age into consideration when rating their global health, the measure Subjective Health C was placed before Subjective Health A. In this position Subjective Health C acted as a contrasting question and hopefully checked against age confounding the ratings made in Subjective Health A.

A decision was made to use the composite variable "Physicians'

Rating" in preference to either "Physician 1's Global Rating" or "Physician 2's Global Rating". "Physicians' Rating" was selected because as a composite variable it was more reliable than its constituent parts. "Physician 1's Group Rating" and "Physician 2's Group Rating" were not included in the analysis because like "Subjective Health C" they were theoretically inappropriate in this study as objective health variables. The measures, Physician 1's Group Rating and Physician 2's Group Rating like Subjective Health C were also only designed as validity checks in the research questionnaire. In particular they functioned as checks against the physicians taking the respondent's age into consideration when making global objective health ratings.

In addition to "Functional limitations, the variables "Self-care limitations", "Physical Activity limitations", "Mobility limitations" and "Social Role Activity limitations" were also retained as measures of objective health. They will be, however, referred to and discussed as "subsidiary" objective health variables, while "Physicians' Rating", "Functional limitations", "Symptom Severity" and "Number of Symptoms" will be referred to and discussed as the main objective health variables.

The means and standard deviations for each of the measures used in this study are presented in Appendix F.

Interrelationship of Variables

The intercorrelations of the variables selected for the analysis are presented in Table 3. The intercorrelations will be discussed according to their respective variable groups; namely objective health, subjective health and personality.

The main objective health variables were found to overall correlate moderately with the subjective health variables. Specifically "Physicians' Rating" was found to correlate moderately with both "Subjective Health A" ($r = .61$) and with "Subjective Health B" ($r = .59$), while "Symptom Severity", "Number of Symptoms" and "Functional limitations" each correlated moderately and negatively with these variables ($r = -.41$ to $r = -.49$). The subsidiary objective health variables, "Self-

care limitations", "Physical Activity limitations", "Mobility limitations" and "Social Role Activity limitations" also correlated moderately and negatively with the subjective health variables (r= -.36 to r= -.51).

"Physicians' Rating" correlated moderately with "Self-esteem" (r= .25) and moderately with "Locus of control" (r= .34). The other main objective health variables showed low to moderate negative correlations with both of these measures (r= -.12 to r= -.39). The subsidiary objective health variables also showed low to moderate negative correlations with the personality variables (r= -.08 to r= -.37). An examination of the interrelationships of the objective health measures reveals correlations ranging from low to high levels. "Physicians' Rating" showed moderate to high negative correlations with all other objective health variables (r= -.49 to r= -.85). With the exclusion of "Physicians' Rating", the remaining objective health variables were found to intercorrelate at low to high levels (r= .06 to r= .93).

With reference to the interrelationships of the personality variables and the subjective health measures, "Self-esteem" correlates moderately with "Subjective Health A" (r= .41) and moderately with "Subjective Health B" (r= .39). The other personality variable, "Locus of control" shows a low correlation with "Subjective Health A" (r= .16) and a low correlation with "Subjective Health B" (r= .17). "Self-esteem" and "Locus of control" were found to intercorrelate at a moderate level (r= .31).

An examination of the interrelationships of the subjective health variables, reveals a high correlation between "Subjective Health A" and "Subjective Health B" (r= .82).

In general, all of the variables selected for the analysis intercorrelate in the direction and at the magnitude that would be expected based upon previous research.

TABLE 3 : CORRELATION MATRIX OF OBJECTIVE HEALTH, PERSONALITY, AND SUBJECTIVE HEALTH MEASURES : (N = 102)

Measures	1	2	3	4	5	6	7	8	9	10	11	12
1. Physicians Rating												
2. Symptom Severity	-.49											
3. Number of Symptoms	-.43	.91										
4. Functional Limitations	-.85	.26	.20									
5. Self-care Limitations	-.62	.12	.06	.83								
6. Physical Activity Limitations	-.80	.30	.24	.89	.67							
7. Mobility Limitations	-.75	.16	.11	.93	.76	.76						
8. Social Role Activity Limitations	-.85	.31	.24	.93	.71	.78	.79					
9. Self esteem*	.25	-.34	-.39	-.13	-.08	-.19	-.12	-.08				
10. Locus of Control**	.34	-.12	-.18	-.33	-.33	-.27	-.37	-.25	.31			
11. Subjective Health A	.61	-.44	-.41	-.49	-.39	-.47	-.39	-.51	.41	.16		
12. Subjective Health B	.59	-.47	-.42	-.49	-.36	-.46	-.40	-.50	.39	.17	.82	

* Low values = Low self-esteem
** Low values = External locus of control

Analysis Procedure

The hypothesis predicted that the personality variables, self-esteem and locus of control, would each have a moderating effect on the relationship between objective health and subjective health in the elderly. To test the validity of this hypothesis it was necessary to test for interactions between the personality variables and the objective health variables. Multiple regression analysis was used for this purpose. To test for the presence of interactions each personality variable was first multiplied with an objective health variable to form a new variable, the interaction term, as described by Cohen and Cohen (1983, Ch 9).

An examination of the interrelationship of the interaction term raw scores and the personality variable raw scores was made pior to the analysis. This revealed the presence of high intercorrelations which would make any interpretation of the results subject to error. To lower these correlations each independent variable was recoded as deviations from their means, as suggested by Cohen and Cohen (1983, pg 368). The resulting correlations were found to be considerably lowered. The intercorrelations before and after recoding are presented in Appendix G.

The main analysis consisted of a series of hierarchical multiple regression analayses. The dependent variables in the analyses were the two subjective health variables, "Subjective Health A" and "Subjective Health B". The independent variables were the personality variables, the objective health variables and the interaction terms which were the product of a personality variable and an objective health variable. The objective health variables were always entered first in the analysis, because of the two predictor variables, they were hypothesised to have the greatest effect on the dependent variables (Cohen & Cohen, 1983;Ch 9). The personality variables which were hypothesised to have a lesser effect on the dependent variables were always entered on the second step, and the interaction term was entererd last (Pedhazur, 1984).

In total 16 multiple regression analyses were run for each dependent variable. An examination of the residual plots revealed no significant departures from linearity.

Results 1

This section will discuss the results of the analyses involving "Subjective Health A", the personality variables and the four main objective health variables, "Physicians' Rating", "Functional limitations", "Symptom Severity" and "Number of Symptoms". The results of the analyses involving "Subjective Health B" and these variables will not be discussed here as the analysis findings for these were virtually identical to those involving the dependent variable, "Subjective Health A". The summary data of the multiple regression analyses involving "Subjective Health B", the personality variables and the four main objective health variables is instead presented for examination in Appendix H and Appendix I.

The multiple regression analyses involving "Subjective Health A" will be discussed according to the personality variable examined.

Self-esteem

Table 4 presents the summary data of the multiple regression analyses where the four main objective health variables, "Self-esteem" and the interaction term were entered into the equation. The squared multiple correlation (r^2), r^2 change, F values and their significance are given for each independent variable. The results showed that all of the objective health variables demonstrated a significant relationship to "Subjective Health A" (Physicians' Rating: $F(1,100)=61.23$, p is greater than .01; Functional limitations: $F(1,100)=33.64$, p is greater than .01; Symptom Severity: $F(1,100)=25.53$, p is greater than .01; Number of Symptoms: $F(1,100)=21.58$, p is greater than .01).

"Self-esteem", after the effects of each objective health variable had been removed also demonstrated a significant relationship to "Subjective Health A" in every case ($F(1,99)=13.21$, p is greater than .01; $F(1,99)=19.81$, p is greater than .01; $F(1,99)=10.76$, p is greater than .01; $F(1,99)=10.04$, p is greater than .01).

With the effects of the objective health variables and "Self-

TABLE 4 : SUMMARY DATA OF MULTIPLE REGRESSION ANALYSES BETWEEN OBJECTIVE HEALTH MEASURES, SELF-ESTEEM, AND SUBJECTIVE HEALTH A

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health A	Physicians' rating		.37	-	61.23	.01
	Self-esteem	102	.45	.072	13.21	.01
	Self-esteem x physicians' rating		.47	.020	3.80	n.s
	Functional limitations		.24	-	33.64	.01
	Self-esteem	102	.37	.124	19.81	.01
	Self-esteem x functional limitations		.37	.004	0.69	n.s
	Symptom severity		.20	-	25.53	.01
	Self-esteem	102	.27	.077	10.76	.01
	Self-esteem x symptom severity		.29	.014	2.08	n.s
	Number of symptoms		.17	-	21.58	.01
	Self-esteem	102	.25	.075	10.04	.01
	Self-esteem x number of symptoms		.26	.013	1.85	n.s

esteem" partialled out, the interactions of "Self-esteem" and the objective health variables failed to demonstrate a significant relationship to "Subjective Health A" (SE x Physicians' Rating: F(1,98)= 3.80, n.s; SE x Functional limitations: F(1,98)=0.69, n.s; SE x Symptom Severity: F(1,98)=2.08, n.s; SE x Number of Symptoms: F(1,98)= 1.85, n.s). The combined variables accounted for a moderate proportion of the variance for "Subjective Health A" in all cases (r^2 =.47, r^2=.37, r^2=.29, r^2=.26).

Locus of control

Table 5 presents the summary data of the multiple regression analyses where the four main objective health variables, "Locus of control" and the interaction term were entered into the equation. As shown in Table 5, all of the objective health variables were found to be significantly related to "Subjective Health A" (Physicians' Rating: F(1,95)=56.68, p is greater than .01; Functional limitations: F(1,95)=30.68, p is greater than .01; Symptom Severity: F(1,95)=27.20, p is greater than .01; Number of Symptoms: F(1,95)=22.61, p is greater than .01).

"Locus of control", after the effects of the objective health variables had been removed, failed to demonstrate a significant relationship to "Subjective Health A" (F(1,94)=0.39, n.s; F(1,94)=0.00, n.s; F(1,94)=1.33, n.s; F(1,94)=0.79, n.s).

With the effects of the objective health variables and "Locus of control" partialled out, "Locus of control" and "Functional limitations" were found to interact significantly to predict "Subjective Health A" (LOC x Functional limitations: F(1,93)=6.90, p is greater than .01). The interactions of "Locus of control" and the remaining objective health variables failed to demonstrate a significant relationship to "Subjective Health A" (LOC x Physicians' Rating: F(1,93)= 2.41, n.s; LOC x Symptom Severity: F(1,93)=2.76, n.s; LOC x Number of Symptoms: F(1,93)=1.35, n.s). In this case the combined variables accounted for a small to moderate proportion of the variance of "Subjective Health A" (r^2=.38, r^2=.29, r^2=.25, r^2=.20).

TABLE 5 : SUMMARY DATA OF MULTIPLE REGRESSION BETWEEN OBJECTIVE HEALTH MEASURES, LOCUS OF CONTROL AND SUBJECTIVE HEALTH A

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health A	Physicians' rating		.37	-	56.68	.01
	Locus of control	97	.37	.002	0.39	n.s
	Locus of control x physicians' rating		.38	.015	2.41	n.s
	Functional limitations		.24	-	30.68	.01
	Locus of control	97	.24	.000	0.00	n.s
	Locus of control x functional limitations		.29	.051	6.90	.01
	Symptom severity		.22	-	27.20	.01
	Locus of control	97	.23	.010	1.33	n.s
	Locus of control x symptom severity		.25	.021	2.76	n.s
	Number of symptoms		.19	-	22.61	.01
	Locus of control	97	.19	.006	0.79	n.s
	Locus of control x number of symptoms		.20	.011	1.35	n.s

Summary

The main objective health variables, "Physicians' Rating", "Functional limitations", "Symptom Severity" and "Number of Symptoms" were all found significant in predicting both subjective health variables. The objective health variables generally accounted for a moderate amount of the variance in the subjective health assessments.

With the effects of the objective health variables removed, "Self-esteem" showed a significant relationship to subjective health assessments while the other personality variable, "Locus of control" failed to demonstrate any significant relationship to subjective health assessments. "Self-esteem" was found to account for a small amount of the variance in the subjective health assessments.

After the effects of the objective health variables and the related personality variable had been removed, the interactions of "Self-esteem" and "Physicians' Rating"; "Locus of control" and "Functional limitations" and "Self-care limitations" and "Social Role limitations were found to be significant in predicting to the subjective health variables. Although significant, none of these interactions accounted for any substantial amount of the variance in the subjective health assessments.

Overall, the combined variables accounted for a small to moderate proportion of the variance in the subjective health assessments.

Analysis of Limitation Variables

A decision was made to analyse "Self-care limitations", "Mobility limitations", "Physical Activity limitations" and "Social Role Activity limitations" separately from the other objective health variables on the grounds that these variables were distinct areas of limitation which may contribute differently to overall functional limitation. This contention was supported by an examination of the interrelationships of the objective health variables in Table 3, which revealed only low to moderate correlations between each functional limitation variable and the other objective health variables.

As in the previous analyses multiple regression analysis was used. An examination of the residual plots again revealed no significant departures from linearity.

Results II

This section will discuss the results of the analyses involving "Subjective Health A", the personality variables and the four subsidiary objective health variables "Self-care limitations", "Physical Activity limitations", "Mobility limitations" and "Social Role Activity limitations". The results of the analyses involving "Subjective Health B" will again not be discussed here, as the analyses findings for those variables were again virtually identical to those involving the dependent variable "Subjective Health A". The summary data of the multiple regression analyses involving "Subjective Health B", the personality variables and the four subsidiary objective health variables are presented in Appendix J and Appendix K.

The results of the analyses involving "Subjective Health A" will again be discussed according to the personality variable under examination.

Self-esteem

Table 6 presents the summary data of the multiple regression analyses where the four subsidiary objective health variables, "Self-esteem" and the interaction term were entered into the equation.The squared multiple correlation (r^2), r^2 change, F values and their significance are provided for each independent variable. The results show that each limitation variable was significant in predicting "Subjective Health A" (Self-care limitations: $F(1,100)=18.62$, p is greater than .01; Physical Activity limitations: $F(1,100)=30.08$, p is greater than .01; Mobility limitations: $F(1,100)=19.11$, p is greater than .01; Social Role Activity limitations: $F(1,100)=36.29$, p is greater than .01).

With the effects of the limitation variables removed, a significant relationship was found between "Self-esteem" and "Subjective Health A" in every case ($F(1,99)=21.32$, p is greater than .01; $F(1,99)=16.57$,

TABLE 6 : SUMMARY DATA OF MULTIPLE REGRESSION BETWEEN SUBSIDIARY OBJECTIVE HEALTH MEASURES, SELF-ESTEEM AND SUBJECTIVE HEALTH A

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health A	Self-care limitations		.15	-	18.62	.01
	Self-esteem	102	.30	.148	21.32	.01
	Self-esteem x self-care limitations		.30	.003	0.47	n.s
	Physical activity limitations		.22	-	30.08	.01
	Self-esteem	102	.33	.109	16.57	.01
	Self-esteem x physical activity limitations		.33	.000	0.08	n.s
	Mobility limitations		.15	-	19.11	.01
	Self-esteem	102	.29	.136	19.40	.01
	Self-esteem x mobility limitations		.30	.011	1.63	n.s
	Social role activity limitations		.26	-	36.29	.01
	Self-esteem	102	.40	.140	23.54	.01
	Self-esteem x social role activity limitations		.40	.004	0.77	n.s

p is greater than .01; F(1,99)=19.40, p is greater than .01; F(1,99))= 23.54, p is greater than .01).

After the effects of both the limitation variables and "Self-esteem" were partialled out, the interaction of "Self-esteem" and the limitation variables were not found significant in predicting "Subjective Health A" (SE x Self-care limitations (F(1,98)=0.47, n.s; SE x Physical Activity limitations: F(1,98)=.08, n.s; SE x Mobility limitations: F(1,98)=1.63, n.s; SE x Social Role Activity limitations: F(1,98)=.77, n.s). The combined variables accounted for a moderate "Subjective Health A" (r^2=.30, r^2=.33, r^2=.30, r^2=.40).

Locus of control

Table 7 presents the summary data of the multiple regression analyses where the four subsidiary objective health variables, "Locus of control" and the interaction term were entered into the equation. As shown in Table 7, each limitation variable was significant in predicting "Subjective health A" (Self-care limitations: F(1,95)=13.79, p is greater than .01; Physical Activity limitations: F(1,95)=30.00, p is greater than .01; Mobility limitations: F(1,95)=17.15, p is greater than .01; Social Role Activity limitations: F(1,95)=34.09, p is greater than .01).

"Locus of control", after the effects of the limitation variables were removed, failed to demonstrate a significant relationship to "Subjective Health A" in any case (F(1,94)=.25, n.s; F(1,94)=.11, n.s; F(1,94)=.03, n.s; F(1,94)=.15, n.s).

With the effects of the limitation variables and "Locus of control" eliminated, "Locus of control" and "Social Role Activity limitations" interacted significantly to predict "Subjective Health A" (LOC x Social Role Activity limitations: F(1,93)=11.61, p is greater than .01). The interaction of "Locus of control" and the other limitation variables were not found to demonstrate a significant relationship to "Subjective Health A" (LOC x Self-care limitations: F(1,93)=2.63, n.s; LOC x Physical Activity limitations; F(1,93)=2.44, n.s; LOC x Mobility limitations: F(1,93)=2.78, n.s). The combined variables

TABLE 7 : SUMMARY DATA OF MULTIPLE REGRESSION ANALYSES BETWEEN SUBSIDIARY OBJECTIVE HEALTH MEASURES, LOCUS OF CONTROL, AND SUBJECTIVE HEALTH A

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health A	Self-care limitations		.12	-	13.79	.01
	Locus of control	97	.12	.002	0.25	n.s
	Locus of control x self-care limitations		.15	.023	2.63	n.s
	Physical activity limitations		.23	-	30.00	.01
	Locus of control	97	.23	.000	0.11	n.s
	Locus of control x physical activity limitations		.25	.019	2.44	n.s
	Mobility limitations		.15	-	17.15	.01
	Locus of control	97	.15	.000	0.03	n.s
	Locus of control x mobility limitations		.17	.024	2.78	n.s
	Social role activity limitations		.26	-	34.09	.01
	Locus of control	97	.26	.001	0.15	n.s
	Locus of control x social role activity limitations		.34	.081	11.61	.01

accounted for a low to moderate amount of the variance for "Subjective Health A" (r^2=.15, r^2=.25, r^2=.17, r^2=.34).

Summary II

The four subsidiary objective health variables, "Self-care limitations", "Physical Activity limitations", "Mobility limitations" and "Social Role Activity limitations" were all found significant in predicting to the subjective health assessments. These variables generally accounted for a small to moderate amount of the variance in the subjective health assessments.

With the effects of the limitation variables removed, "Self-esteem" again demonstrated a significant relationship to subjective health assessments, while the other personality variable "Locus of control" failed to demonstrate a significant relationship to subjective health assessments. "Self-esteem" accounted for a small amount of the variance in subjective health assessments.

After the effects of the limitation variables and the related personality variable had been removed, only the interaction of "Locus of control" and "Social Role Activity limitations" was significant in predicting to subjective health assessments. Although significant this interaction did not account for a substantial amount of the variance in subjective health assessments.

Overall, the combined variables accounted for a small to moderate proportion of the variance in the subjective health assessments.

CHAPTER VIII

DISCUSSION

Prior to reintroducing the hypothesis and discussing the research findings, it is first necessary to consider why the findings of the analyses involving the dependent variables, "Subjective Health A" and "Subjective Health B", were essentially identical in nature.

Each of these measures of subjective health differed in a) the health dimensions employed b) the scale of measurement used and c) the degree of subjective health discrimination allowed in each. As such it was expected, but not confirmed in the results, that the personality and objective health variables would interact differently with these measures of subjective health.

One explanation for this finding is that regardless of the differences between the two dependent variables, each still tapped the same basic components of an elderly individual's subjective health. Support for this explanation is provided in Table 3, where a high intercorrelation can be found between "Subjective Health A" and "Subjective Health B" (r=.82), and where the interrelationships between these two variables and all of the other variables are virtually identical.

In terms of future research this indicates that various types of "global" subjective health measures can be used with the confidence that each will, regardless, assess the underlying components of subjective health. The hypothesis will now be reintroduced.

The hypothesis predicted that the two personality variables, self-esteem and locus of control, would each interact with the objective health variables to moderate between an elderly individual's objective health and his or her subjective health assessment. This hypothesis will be discussed with reference to the findings of the analyses involving firstly self-esteem and then locus of control.

Self-esteem was found to interact significantly with only one of eight objective health variables to predict subjective assessments of health in the elderly. While this finding appears to provide at least some support for the hypothesis, this interaction did not however account for any substantial amount of the variance in subjective health assessments, nor as noted were self-esteem interactions consistently replicated across the other objective health measures. Thus the hypothesis with respect to the personality variable, self-esteem is one which is largely unsupported.

Locus of Control was also found to interact significantly with objective health to predict subjective assessments of health. However these interactions also failed to account for any substantial amount of the variance in subjective health assessments. Locus of control interactions were in addition limited to only two of the eight objective health variables employed in this study. As such the hypothesis that Locus of control moderates the effects of objective health to predict subjective assessments of health is also without firm support.

The main effects of all of the objective health variables were however found to significantly predict subjective assessments of health. The objective health variables were found on average to account for a moderate proportion of the variance of subjective health assessments ($R2 = .10$ to $.37$). This indicates that objective health has an important and strong relationship to an elderly person's subjective assessment of his or her health. It would be expected from these results that an elderly individual with good objective health would be more likely to subjectively assess his or her health as good, than when in poor objective health. Similarly the reversed relationship would also be expected.

This finding supports previous research which has found objective health to enjoy a significant though not fully explanatory relationship to subjective assessments of health (Suchman et al, 1958; Friedsam & Martin, 1963; Maddox, 1962; etc). However the present study does differ from previous research in that it registered, compared to earlier studies, a stronger relationship between some objective health measures and the respondent's subjective assessment of his

or her health. The correlation coefficients between the physicians' global ratings of health and the elderlies' global ratings were for example highly correlated at r=.59 and r=.61 (see Table 3). Previous research on the other hand has typically found only moderate relationships between objective and subjective health.

A number of reasons can be proposed to account for this finding. Firstly compared to previous research this study investigated a population that was heterogeneous in nature with respect to health. As such it would be expected that a truer relationship would be revealed in the study analysis. Secondly the current study also made use of a normative subjective health rating as a check designed to extract valid measures of an elderly individuals' subjective health. Finally compared to some previous research the present study made use of more comprehensive measures of health status.

Self-esteem, was as a main effect also found to be significant in predicting subjective health assessments of the elderly. Self-esteem on average accounted for a small proportion of the variance of subjective health assessments (R2=.06 to .14). While this percentage would seem inconsequential in other research; it is with regard to subjective health assessments, quite a large variance to be explained by a non-medical factor.

As such self-esteem can also be seen as demonstrating an important relationship to subjective assessments of health in the elderly, though less important when compared to objective health status.

This result suggests that an individual with high self-esteem would be predisposed to assess his or her health positively while an individual with low self-esteem would be more likely to assess his or her health negatively. The implications of this will be discussed further below. The relationship between self-esteem and an elderly person's subjective assessments of health, while new in the literature, does support previous research which has found non-medical variables to be significantly related to subjective assessments of health. However like objective health, self-esteem was found in this study to enjoy a stronger relationship to subjective health assessments than noted with other non-medical factors in previous studies.

One possible explanation for this finding lies in the method of objective health assessment used in this study. Indirect assessment by physicians may better reveal a relationship between subjective health and self-esteem. For example it is possible that in a normal clinical examination of health, an elderly individual's personality confounds the physician's rating.

Locus of Control, as a main effect, was not found to be significant in predicting subjective assessments of health in the elderly. As such locus of control appears to be largely unimportant as a determinant of an elderly individual's perception of his or her health status.

Overall, the results of the analyses give only very limited support to the hypothesis. While both self-esteem and locus of control did, on occassions, moderate the effects of objective health on the elderly's subjective assessments of health on occassions, these interactions were not consistently found across all of the objective health measures. Furthermore, when they occurred they accounted, on average, for only a very small amount of the variance in subjective health assessments.

The results of the analysis give greater support to additive rather than interactive relationships moderating subjective assessments of health in the elderly. While locus of control appears to have neither an interactive nor an additive relationship to subjective assessments of health, self-esteem was found to contribute directly and independently to an elderly individual's subjective assessment of his or her health. In combination with objective health, self-esteem explained a significant amount of the variance in subjective health assessments of the elderly.

The failure to find personality variables consistently interacting with other variables to moderate health related outcomes has also been reported previously in the literature.

Cooke and Rousseau (1983) for example in their research found that an individual's personality and his or her personal orientation failed to moderate between life events and symptoms of strain.

Kobasa, Maddi and Courington (1981), in a study previously mentioned, did not find consistent interactions between personality variables and stressful life events in predicting an individuals objective health as measured by symptoms of strain.

However alternately the results may also be explained by methodological problems in this study. In particular the locus of control measure was subjectively found to cause problems with the elderly. One such problem concerned the locus of control's wording which resembles standard cliches. As such many of the elderly appeared to respond to the statements as accepted knowledge rather than in a critical manner. As noted the elderly were also found to have problems with the abstract nature of the scale and the discriminatory responses required. Finally the locus of control scale employed made no allowance for the existance of a deity, an aspect very relevant to individuals close to death.

Although no problems were found in the administration of the self-esteem measure future research using this scale with the elderly may benefit from the use of a social desirability check.

Methodological problems in the research may also have arisen through the sample obtained. Although positive in that a heterogenous sample of health was measured, those who were healthy may have been prior to analysis biased towards internal locus of control and high self-esteem. A factor analysis which was beyond the scope of the hypothesis would be beneficial in examining this possibility.

Implications

The present study can be seen to have two types of implications for those investigating subjective health assessments of health in the elderly.

Firstly from a methodological point of view the present study argues strongly for the use of a heterogenous population of health to be used with regard to future measurement of subjective health status. The strength of the relationships discovered here implies that the often used, small and select groups have been inadequate in the past in revealing the true nature of subjective health variables.

Secondly the current study also argues for the use of validity checks against elderly individuals assessing their health against each other rather than against the standard of "global" health. In this respect it would also be wise for researchers to define and measure subjective health more precisely.

Thirdly present study in utilising a number of objective health variables demonstrates that no single measure alone can be taken as "the" measure of objective health status. Objective health variables were found to show as much variability compared to each other as compared to non-objective health variables. Those objective health variables which showed the greatest relationships were those which composed a synthesis of information regarding an individual's health condition.

Finally, two implications with regard to the theoretical nature of subjective health can be deduced from this study. One of these concerns a caution against using subjective health assessments as a proxy measure for objective health. The second refers to the newly found relationship between an elderly individual's self-esteem and his or her subjective health assessments. Although the variance that self-esteem explains of subjective health assessments is small it still predisposes an elderly individual towards either a positive or negative self-health rating. If this tendency is responsible for the relationship seen for example between subjective health assessments and mortality , then interventionist strategies designed to change an individual's self-esteem could also change the probability of that individual dying within a certain time. This possibility is made more likely when it is noted that the relationship between mortality and subjective health assessments occurred irrespective of the elderly individuals' objective health status.

One suggestion for future research would be the investigation of other personality variables and characteristics considered to have significance for the elderly. Two of these could be the degree of religous preoccupation an elderly individual has and also the degree of meaning in life he or she maintains.

Secondly research could investigate the presence of a personality "style" similar to Antonovsky's (1979) "sense of coherence" or Kobasa's (1979) "hardiness" which could influence an elderly individual's subjective health assessments. While self-esteem has been found to enjoy a significant relationship to subjective health assessments in the elderly, it may well be only one of a number of personality variables determining subjective health assessments. Certainly much unexplained variance remains with respect to the elderlies subjective health.

Finally, research to implement one of the research findings in this study could be undertaken. In particular a study which investigates the relationship between self-esteem, subjective health assessments in the elderly and behavioural outcomes could be undertaken. For example, interventions could be designed to increase an elderly individual's self-esteem to observe both the possible change in his or her subjective health assessments and psychological and behavioural outcomes.

Conclusion

In conclusion, the findings from this study indicate that both an elderly individual's objective health status and his or her self-esteem bear an important relationship to that individual's subjective health assessment. Of the two, objective health status was found to have a stronger relationship with subjective health assessments than self-esteem did. Locus of control did not show any relationship to subjective health assessments in the elderly at all. With respect to the hypothesis, objective health status and self-esteem each appeared to have an additive rather than an interactive relationship with each other in moderating subjective health assessments in the elderly.

Research into the elderlies subjective health would seem to be an important investigative area. Certainly much unexplained variance in an elderly individual's subjective health assessment remains. This variance may well hold the key to revealing why so many positive attributes and outcomes result from good subjective health assessments and why so many negative attributes and outcomes result from the subjective health assessments that are poor.

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APPENDIX A: LETTER TO OFFICIALS

Massey University

DEPARTMENT OF PSYCHOLOGY

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES, 69-079, 69-089, 69-099.

In reply please quote:

4 July 1984

Dear Sir/Madam,

The following student, Mr Michael Harvey, is currently involved in research as part of his work towards a Master of Arts Degree in Psychology at Massey University. His research seeks to examine the opinions and beliefs of people 60 years of age and over in aged persons homes and nursing care units. The perceptions of the residents about life in general, and about their health are the focus on interest. Mr Harvey would like to interview each resident individually during a time that is convenient to the staff and resident. We anticiapted that the total time for each participant would be in the range ½ to 1½ hours.

Mr Harvey will be able to show you examples of the questions we wish to use. None of the questions asked are envisaged to cause any anxiety or stress to the resident. Each person will be free to withdraw from the research at any point.

The period of involvement for each home or unit will be around one to two weeks depending on the number of residents who participate. The confidentiality and anonymity of those who participate in the research will be protected. The name of the home or unit, and the names of the residents will be assigned a code number by which the content of the responses will be analysed. A report on the findings of the research will be given to your home or unit when the research is completed.

I would be very grateful if you could give assistance to Mr Harvey to enable him to carry out his research. If you have any further questions please feel free to contact me at Massey University, Phone 69-099 Ext.8300 or Ext. 7694.

Yours sincerely,

KERRY CHAMBERLAIN
SENIOR LECTURER IN PSYCHOLOGY.

APPENDIX B: CONSENT FORM

Massey University

PALMERSTON NORTH, NEW ZEALAND.
TELEPHONES, 69-099, 69-089.

In reply please quote:

Consent to Act As A Respondent in Research of Aged in Homes and Nursing Care Units.

I agree to participate in the study explained to me by Mr Mike Harvey, a postgraduate psychology student.

I understand Mr Harvey is interested in studying the health and attitudes of persons over 60 years of age living in Homes and Nursing Care Units. My participation will be an interview concerning my health and attitudes. During this interview I will be asked to complete a questionnaire. I understand that I can stop the interview at any time.

I understand that the interview is confidential. Only the content of the responses will be examined. The name of the institution and my name will not appear in any report of this study.

I understand my participation is voluntary and that I can refuse to participate or withdraw from the study at any time.

Signature _____

Date _____

MASSEY UNIVERSITY
LIBRARY

APPENDIX C: LETTER TO SUBJECTS

Massey University

PALMERSTON NORTH, NEW ZEALAND

TELEPHONES, 69-079, 69-089, 69-099.

In reply please quote:

Michael B Harvey
Psychology Department
Massey University
Palmerston North

23 September 1984

Dear Resident of_____

I am a postgraduate student completing my Masters Degree at Massey University. I have been in contact with the controlling body of your housing complex _____ and am interested in interviewing people over 60 about their health and beliefs.

In the next few days I will be calling on you to ask if you would like to participate in this study. Participation would involve only a short interview. Participation, of course, is voluntary, and all information will remain confidential.

Yours sincerely,

MICHAEL HARVEY
MASTERATE STUDENT
MASSEY UNIVERSITY.

APPENDIX D: QUESTIONNAIRE USED IN THE PRESENT STUDY

HEALTH AND ATTITUDE SURVEY

Although people are similar to each other in many ways, they are also different. For example people differ from one another in their state of health and also differ in the attitudes and beliefs they hold about themselves and life in general.

In this study we are trying to find out about the health, attitudes and beliefs of people over the age of 60.

This questionnaire looks at your health, attitudes and beliefs. There are no right or wrong answers; an answer is right if it is true for you. It is important that you answer all questions as carefully and honestly as possible. We do not need to know your name and all the information you give will be kept strictly confidential.

Instructions

This is not a very long questionnaire, but it will take you some time to complete. Please choose a quiet place, free from distractions where you are not likely to be interrupted. While you may wish to discuss these questions with other people, please don't do this until you have answered them all. Most of the questions should be interesting, many will be easy but some questions will be hard. Answer them all as well as you can. If you have any problem with a question, leave it and discuss the problem with the researcher when he comes to collect the questionnaire.

MASSEY UNIVERSITY

Just as health varies from person to person, health also varies from month to month and day to day.

At times people enjoy good health and at other times people experience health that is poor. Yet again at other times people experience health that is neither good nor poor but instead is inbetween or "fair".

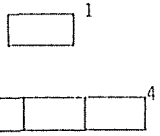
Below are some questions about your health. We want you to circle the number next to the word which best describes your health <u>at the present time</u>. For example if you feel your current health is "Poor", you would circle number 3.

Compared to <u>others your own age</u>, how would you rate your health at the present time? (Circle the appropriate number).

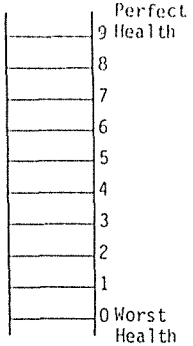
1. Terrible
2. Very poor
3. Poor
4. Fair
5. Good
6. Very good
7. Excellent

Compared to <u>the person in excellent health</u>, how would you rate your health at the present time?
(Circle the appropriate number).

1. Terrible
2. Very poor
3. Poor
4. Fair
5. Good
6. Very good
7. Excellent



Here is a picture of a ladder. At the bottom of the ladder is the worst possible health you might reasonably expect to have. At the top of the ladder is the best (Perfect) health you might expect to have.
On the ladder mark an (X) on the rung where you would put your health at the present time.



Like health, people's feelings about their lives also vary. How do you currently feel about your life as a whole? (Circle the appropriate number).

1. Terrible
2. Very dissatisfied
3. Mostly dissatisfied
4. Mixed about equally satisfied or dissatisfied
5. Mostly satisfied
6. Very satisfied
7. Delighted.

Now here are more specific questions about your health. Listed below are a number of medical conditions that you may or may not be suffering from. Please tick Yes if you are currently suffering from the condition and No if you are not.

As far as you know, do you <u>currently have</u> any of these conditions: (Tick (✓) either Yes or No).

	1 Yes	2 No
A cold?		
"Flu" (influenza)?		
A sore throat?		
Frequent digestive upsets?		
Frequent headaches?		
Frequent migraines?		
Boils or abscesses?		
Bedsore(s)?		
Coldsore(s)?		
Carbuncle(s)?		

10

15

	1 Yes	2 No	For Office Use
Swollen, stiff or painful joints (arthritis; rheumatism)?	☐	☐	☐
Swollen arms or legs?	☐	☐	
Broken or fractured arm?	☐	☐	
Broken or fractured hand or foot?	☐	☐	
Broken or fractured leg?	☐	☐	
Dislocated hip or other joint?	☐	☐	
Severe sprain?	☐	☐	
An injury with paralysis?	☐	☐	
An amputated limb or limbs?	☐	☐	
Severe cuts or bruising?	☐	☐	
Burn(s)?	☐	☐	☐
An eye infection?	☐	☐	☐
Cataracts?	☐	☐	
A sty?	☐	☐	☐ 20
Defective curvature of the eye (astigmatism)?	☐	☐	☐
An ear infection?	☐	☐	☐
A severe hearing loss? (e.g. cannot hear-without a hearing aid)	☐	☐	☐
Frequent nosebleeds?	☐	☐	☐
Sinus trouble?	☐	☐	☐ 25
Allergies (hayfever etc)?	☐	☐	☐
An abscessed tooth?	☐	☐	☐
Periods of hiccuping?	☐	☐	☐
Shortness of breath?	☐	☐	
Asthma?	☐	☐	☐
Periods when your breathing becomes rapid, deep and prolonged?	☐	☐	☐ 30
A bad taste in the mouth?	☐	☐	☐
Bronchitis?	☐	☐	☐
Whooping cough?	☐	☐	☐

	1 Yes	2 No	For Office Use
Laryngitis?	☐	☐	☐
Pneumonia?	☐	☐	☐ 35
Goiter (enlarged thyroid)?	☐	☐	☐
Tonsilitis?	☐	☐	
Glandular fever?	☐	☐	☐
Tuberculosis (T.B.)?	☐	☐	☐
Kidney or gallstones? (Circle which)	☐	☐	☐
Appendicitis?	☐	☐	☐ 40
"Rupture" (hernia)?	☐	☐	☐
Difficulty moving your bowels (constipation)?	☐	☐	☐
Loose bowel movements (diarrhea)?	☐	☐	☐
Trouble passing urine?	☐	☐	
Dysentry?	☐	☐	
Hepatitis?	☐	☐	☐
Worms?	☐	☐	
"Piles" (hemorrhoid trouble)?	☐	☐	☐ 45
Gout?	☐	☐	☐
Varicose veins?	☐	☐	☐
Diabetes?	☐	☐	☐
"Fits" (epilepsy)?	☐	☐	☐
Eczema?	☐	☐	☐ 50
A fungus infection (e.g., athlete's foot,-ringworm)	☐	☐	☐
Shingles?	☐	☐	☐
Scabies?	☐	☐	☐
Dandruff?	☐	☐	☐
Scaly red patches on your skin?	☐	☐	☐ 55
Corns?	☐	☐	☐
Wart(s)?	☐	☐	☐
Pain in the back or shoulders?	☐	☐	☐

	1 Yes	2 No
Chestpain? (Not due to heartburn)		
Heartburn?		
An allergy caused by a particular drug?		
Physical dependency on a drug?		
(Please specify what drug _____)		
Colourblindness?		

Has a doctor or nurse told you that you have:

(Please tick (✓) Yes or No)

	1 Yes	2 No
High blood pressure (hypertension)?		
Low blood pressure (hypotension)?		
Anemia?		
A blood clot in your blood vessels?		
A blood clot in your lungs?		
A collapsed lung?		
Swelling of the lung tissue (emphysema)?		
A heart defect which was present from birth?		
An irregular heartbeat or heart murmur?		
Hardening of the arteries?		
Leukemia?		
Uremia (toxic waste in the blood)?		
Glaucoma (a type of eye disease)?		
Jaundice (yellowing of the skin and eyes)?		
Food poisoning?		
Cirrhosis of the liver?		
Rheumatic fever?		
Gangrene?		
A slipped disk?		
A stomach ulcer?		
Inflamed tissue cavities (bursitis)?		
A bladder infection?		
A kidney infection?		

For Office Use 6

60 65 70 75 80 1

	1 Yes	2 No
An overactive thyroid (hyperthyroidism)?		
An underactive thyroid (hypothyroidism)?		
Multiple sclerosis?		
Muscular dystrophy?		
A tumour of the spinal chord?		
Spinal meningitis?		
Curvature of the spine?		
Parkinson's Disease?		
Cancer?		
Addison's Disease?		
Cushing's Disease?		
Hodgkin's Disease?		
A brain infection (e.g, encephalitis)?		
An ovarian cyst?		
Fibroids of the uterus?		
Any other problem or illness we have not listed above?		
(Please specify what _____)		
Do you need glasses to read newspapers and books?		
Do you need glasses to read signs at a distance?		
Have you felt dizzy or lightheaded recently?		
Have you had a fainting spell or a blackout recently?		
Do you currently feel depressed?		
Do you suffer from "nerves"? (e.g, anxiety which causes you to shake and tremble)		
Have you lost a lot of weight recently?		

For Office Use 7

5 10 15

	1 Yes	2 No	For Office Use
Are you currently overweight?	☐	☐	☐
Are you currently able to sleep and wake up well rested?	☐	☐	
Have you suffered from a stroke in the last 3 months?	☐	☐	☐
How many strokes have you suffered? (Circle one) 0 1 2 3			
Have you had a heart attack or failure in the last 3 months? (Circle which)	☐	☐	☐ 20
How many heart attacks or failures have you had? (Circle one) 0 1 2 3			
Do you drink alcohol?	☐	☐	
Do you take 2 or more alcoholic drinks per day?	☐	☐	
Do you yourself or others consider that you have an alcohol problem?	☐	☐	☐
Do you smoke cigars or a pipe regularly?	☐	☐	

For how many years have you or did you, smoke cigarettes, cigars or pipes? (Circle the appropriate number)

0 1-10 11-20 21-30 31-40 40 plus years

How many cigarettes do you smoke daily? (Circle the appropriate number)

0 1-10 11-20 21-30 31-40 40 plus per day

How do you usually feel during the day? (Circle the appropriate number).

1. Full of energy all day
2. Energetic at times
3. Tired
4. Very tired
5. Completely fatigued

For Office Use 9

Is your appetite good? (Circle the appropriate number).

1. Every day
2. Almost every day
3. Once in a while
4. Rarely or never

How much exercise do you get? (Tick (✓) those that are appropriate to you).

None	☐
Normal daily tasks	☐
Daily walk	☐
Recreation or sports	☐
A routine fitness program	☐

If you have ever been in hospital for any medical illness or operation, write in your most recent hospitalizations below.

	Year	Operation or illness	Time spent in hospital
Most recent hospitalization			
2nd most recent			
3rd most recent			
4th most recent			

In the past year, did you take any drugs or medications, excluding vitamins, continuously for one month or more? (Tick (✓) Yes or No) .....Yes ☐ No ☐

If "Yes", what was the nature of these drugs or medications? _____

_____

Why did you take them and how often? _____

_____

_____

Here are some questions concerning what your health allows you to do or not do. Please circle the answer which is correct for you.

1. Does your current health prevent you from driving a car or using public transportation?
   (Circle No or Yes)

   No — Yes ↓

   1(b) How long has your current health prevented you from driving a car or using public transportation?
   (Circle one)

   Less than 1 month 1
   1-3 months 2
   More than 3 months 3

☐

2. Does your health restrict you from being able to travel around your community freely?
   (Circle No or Yes)

   No — Yes ↓

   2(b) How long have you had this trouble?
   (Circle one)

   Less than 1 month 1
   1-3 months 2
   More than 3 months 3

☐

3. When you travel around your community does someone have to assist you because of your current health?
   (Circle No or Yes)

   No — Yes ↓

   3(b) How long have you needed someone to assist you?
   (Circle one)

   Less than 1 month 1
   1-3 months 2
   More than 3 months 3

☐

4. Do you need help to go outside because of your health?
   (Circle No or Yes)

   No — Yes ↓

   4(b) How long have you needed help to go outside?
   (Circle one)

   Less than 1 month 1
   1-3 months 2
   More than 3 months 3

☐ 25

5. Do you have to stay indoors most or all of the day because of your health?

(Circle No or Yes)

No — Yes

5(b) How long have you had to stay indoors?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

6. Are you in a hospital, nursing home or other medical facility because of your health?

(Circle No or Yes)

No — Yes

6(b) How long have you been in a hospital, nursing home or other medical facility?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

7. Do you need a cane, crutches, artifical limbs, braces or the assistance of another person to help you walk?

(Circle No or Yes)

No — Yes

7(b) How long have you needed one of these?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

For Office Use 12

8. Do you have trouble lifting, stooping, using stairs or inclines (walking up ramps or hills)?

(Circle No or Yes)

No — Yes

8(b) How long have you had this trouble?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

9. Do you have trouble walking as far and as fast as is usual for healthy persons your age?

(Circle No or Yes)

No — Yes

9(b) How long have you had this trouble?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

10. Are you currently in a wheel chair that you yourself are able to propel?

(Circle No or Yes)

No — Yes

10(b) How long have you been in a wheelchair?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

For Office Use 13

30

For Office Use 14

11. Are you in bed, a chair or a wheelchair (that you cannot use alone) for most or all of the day because of your health?
(Circle No or Yes)

No — Yes ↓

11(b) How long have you been in a bed, chair or a wheelchair (that you cannot use alone)?
(Circle one)

Less than 1 month 1
1-3 months 2
More than 3 months 3

12. Do you need help with eating, dressing, bathing, or using the toilet?
(Circle No or Yes)

No — Yes ↓

12(b) How long have you needed help with one of these?
(Circle one)

Less than 1 month 1
1-3 months 2
More than 3 months 3

For Office Use 15

13. Amongst the following activities is there any that you could not do because of your current health - attending church or civic functions, shopping, playing lawn bowls, reading, watching T.V. or pursuing hobbies?
(Circle No or Yes)

No — Yes ↓

13(b) How long has your health prevented you from doing any of the above activities, if you so wished?
(Circle one)

Less than 1 month 1
1-3 months 2
More than 3 months 3

14. Does your health limit how much of each activity that you could do - such as attending church or civic functions, shopping, playing sports, reading, watching T.V., pursuing hobbies and so forth?
(Circle No or Yes)

No — Yes ↓

14(b) How long has your health limited the amount of each activity that you can do?
(Circle one)

Less than 1 month 1
1-3 months 2
More than 3 months 3

35

15. Are you (or would you) be unable to do certain kinds of housework because of your current health?

(Circle No or Yes)

No — Yes

15(b) How long have you been unable to do certain kinds of house work because of your health?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

16. Does (or would) your current health limit the amount of housework that you can do?

(Circle No or Yes)

No — Yes

16(b) How long has your current health limited the amount of housework you can do?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

17. Does (or would) your current health prevent you from doing housework altogether?

(Circle No or Yes)

No — Yes

17(b) How long has your current health prevented you from doing all housework?

(Circle one)

Less than 1 month 1

1-3 months 2

More than 3 months 3

For Office Use 16

17

Next are a number of statements about various topics. There are no right or wrong answers; for every statement there are large numbers of people who agree and disagree. Please indicate how much you agree or disagree with each statement below by circling the appropriate letter(s).

SA Strongly agree

A Agree

D Disagree

SD Stongly Disagree

Wars between countries seem inevitable despite efforts to prevent them ..... SA A D SD

It is usually true of successful people that their good breaks far outweighed their bad breaks ..... SA A D SD

Many times I feel that we might just as well make many of our decisions by flipping a coin ..... SA A D SD

The actions of other people toward me many times have me baffled ..... SA A D SD

Getting a good job seems to be largely a matter of being lucky enough to be in the right place at the right time ... SA A D SD

A great deal that happens to me is probably just a matter of chance ..... SA A D SD

40

SA Strongly agree
A Agree
D Disagree
SD Strongly Disagree

I feel I have little influence over the way people behave ..... SA A D SD

Much of the time the future seems uncertain to me ..... SA A D SD

Some people seem born to fail while others seem born for success no matter what they do ..... SA A D SD

It is difficult for ordinary people to have much control over what politicians do in office ..... SA A D SD

I feel that many people could be described as victims of circumstances beyond their control ..... SA A D SD

It seemed that many times the grades one got in school were more dependent on the teachers' whims than on what the student could really do ..... SA A D SD

It isn't wise to plan too far ahead because most things turn out to be a matter of good or bad fortune anyhow ..... SA A D SD

I can't understand how it is possible to predict other peoples behaviour ..... SA A D SD

When things are going well for me I consider it due to a run of good luck ..... SA A D SD

45

50

SA Strongly agree
A Agree
D Disagree
SD Strongly Disagree

There was not much use in trying to predict which question a teacher was going to ask on an examination at school ..... SA A D SD

Most people don't realize the extent to which their lives are controlled by accidental happenings ..... SA A D SD

I have usually found that what is going to happen will happen, regardless of my actions ..... SA A D SD

Most of the disappointing things in my life have contained a large element of chance .. SA A D SD

I don't believe that a person can really be a master of his fate ..... SA A D SD

Success is mostly a matter of getting good breaks ..... SA A D SD

Events in the world seem to be beyond the control of most people ..... SA A D SD

I feel that most people can't really be held responsible for themselves since no-one has much choice about where he was born or raised ..... SA A D SD

Many times the reactions of people seem haphazard to me ..... SA A D SD

There's not much use in worrying about things...what will be, will be ..... SA A D SD

60

SA Strongly agree

A Agree

D Disagree

SD Stongly Disagree

Success in dealing with people seems to be more a matter of the other person's moods and feelings at the time rather than ones own actions ..... SA A D SD

I think that life is mostly a gamble ..... SA A D SD

Many times I feel that I have little influence over the things that happen to me ..... SA A D SD

Sometimes I feel that I don't have enough control over the direction my life is taking ..... SA A D SD

Life is too full of uncertainties ..... SA A D SD

Here are some more statements. If the statement describes how you usually feel, put a tick (✓) in the column, "Like Me". If the statement does not describe how you usually feel, put a tick (✓) in the column "Unlike Me". There are no right or wrong answers.

	Like Me	Unlike Me
I often wish I were someone else ..		
I find it very hard to talk in front of a group		
There are a lot of things about myself I would change if I could ..		
I can make up my mind without too much trouble		
I'm a lot of fun to be with		
I get upset easily		

70

	Like Me	Unlike Me
It takes me a long time to get used to any thing new		
I'm popular with people my own age .		
My family and friends expect too much of me		
My family and friends usually consider my feelings		
I give in very easily		
Its very hard to be me		
Things are all mixed up in my life		
Other people usually follow my ideas		
I have a low opinion of myself		
I'm pretty happy		
I often feel upset about the things that I do		
I wish I were younger		
If I have something to say, I usually say it		
My family and friends understand me		
Most people are better liked than I am		
I usually feel as if family and friends are pushing me		
I often get discouraged at what I am doing		
Things usually don't bother me		
I can't be depended on		

75 80 1 5 10

Now we would like to ask you for some information which will help us understand and interpret the data from this study.

In what year were you born? ..... ☐☐

Are you a male or female? ..... Male ☐ Female ☐ 15

Thank you very much for helping us with this project. We appreciate you giving us your time, and hope that you have found the experience interesting.

APPENDIX E: PSYSICIANS RATING SHEET

Health Summary Sheet

Code: ☐☐☐

Age: ☐☐

Sex: Male ☐ Female ☐

Functional Limitations Level (Below A=increasing limitations)

Physical activity level

A Has no physical activity limitations ☐

B Needs a walking stick,crutches,artificial limbs,braces or the assistance of another person to walk ☐ ;Has trouble lifting,stooping, using stairs or inclines ☐ ;Has trouble walking as far and as fast as healthy persons own age ☐

C Is in a wheelchair and can propel it by self ☐

D Is in a bed,a chair or a wheelchair that cannot be used without help, for most or all of the day because of health ☐

Limited for Less than 1 month ☐ 1-3 months ☐ More than 3 months ☐

Mobility level

A Has no mobility limitations ☐

B Cannot use a car or public transportation because of health ☐ ;Health restricts ease of travel ☐ ;Recquires assistance to travel ☐

C Needs help to go out side ☐ ;Has to stay indoors most or all of day because of health ☐

D Is in a hospital,nursing home or other medical facility because of health ☐

Limited for Less than 1 month ☐ 1-3 months ☐ More than 3 months ☐

Social Role activity limitations

A Performs social roles appropriate for age,e.g,keeping house and gentle leisure ☐

B Health prevents subject from doing one or more,or how much can be done of the following-church/civic functions,shopping,lawn bowls, reading,T.V,pursuing hobbies ☐

C Is or would be unable to do certain kinds or amount of housework ☐

D Is or would be unable to do any housework at all ☐

Limited for Less than 1 month ☐ 1-3 months ☐ More than 3 months ☐

Self-care limitations

A Needs no help with self-care ☐

B Needs help with eating or dressing,bathing or using the toilet

Limited for Less than 1 month ☐ 1-3 months ☐ More than 3 months ☐

Symptoms/Illness/Problems

Drugs/Medication

None ☐

Uses/Takes ☐ -

Stroke

Has suffered 0 1 2 3 strokes in lifetime

Has suffered a stroke in last 3 months Yes ☐ No ☐

Heart attack/Failure

Has suffered 0 1 2 3 heart attacks/failures in lifetime

Has suffered a heart attack/failure in last 3 months Yes ☐ No ☐

Last Hospitalisations

Most recent

2nd to last

3rd to last

4th to last

Appetite/Weight

Appetite is good- ☐ Every day
☐ Almost every day
☐ Once in a while
☐ Rarely or never

Is currently overweight Yes ☐ No ☐

Has lost a lot of weight recently Yes ☐ No ☐

Exercise

Exercise level- ☐ None
☐ Normal daily tasks
☐ Daily walk
☐ Recreation or sport
☐ Routine fitness program

Sleep pattern/Energy level

Is currently able to sleep and wake up well rested Yes ☐ No ☐

Feels during the day- ☐ Full of energy
☐ Energetic at times (Normal)
☐ Tired
☐ Very tired
☐ Completely fatigued

Cigarettes

Has ever smoked Yes ☐ No ☐

Currently smokes Yes ☐ No ☐

Number smoked per day 0 1-10 11-20 21-30 31-40 40+

Number of years smoked 0 1-10 11-20 21-30 31-40 40+

Alcohol

Drinks alcohol Yes ☐ No ☐

Takes 2 or more alcoholic drinks per day Yes ☐ No ☐

Ratings

Compared to others the subjects age (☐☐), how would you rate his or her health at the present time? (Circle the appropriate number).

1. Terrible
2. Very poor
3. Poor
4. Fair
5. Good
6. Very good
7. Excellent

Compared to the person in excellent health, how would you rate the subject's health at the present time? (Circle the appropriate number).

1. Terrible
2. Very poor
3. Poor
4. Fair
5. Good
6. Very good
7. Excellent

APPENDIX F : MEANS AND STANDARD DEVIATIONS FOR OBJECTIVE HEALTH, PERSONALITY, SUBJECTIVE HEALTH AND WELL-BEING MEASURES, OBTAINED FROM QUESTIONNAIRE

Measure	M	SD
Physician 1's Rating	3.755	1.346
Physician 2's Rating	4.245	1.270
Physicians' Rating (Composite)	4.000	1.266
Symptom Severity	258.372	150.196
Number of Symptoms	5.951	2.637
Functional Limitations	10.696	9.858
Self-care Limitations	0.843	1.333
Physical Activity Limitations	2.578	2.615
Mobility Limitations	3.078	3.388
Social Role Activity Limitations	4.196	3.496
Self-esteem	5.205	3.877
Locus of Control	5.030	2.732
Subjective Health A	4.500	1.355
Subjective Health B	5.559	1.854
Subjective Health C	5.098	1.255
Life 1	5.196	1.034

APPENDIX G : INTERCORRELATIONS OF PERSONALITY VARIABLES WITH INTERACTION TERMS, BEFORE AND AFTER USING RAW SCORES AND DEVIATION SCORES

INTERACTION TERM	CORRELATION WITH SELF-ESTEEM	
	Raw Score	Deviation Score
Self-esteem x Physicians' Rating	.86	-.22
Self-esteem x Functional Limitations	.69	.17
Self-esteem x Symptom Severity	.83	.18
Self-esteem x Number of Symptoms	.89	.25

	CORRELATION WITH LOCUS OF CONTROL	
	Raw Score	Deviation Score
Locus of Control x Physicians' Rating	.81	-.06
Locus of Control x Functional Limitations	.87	.07
Locus of Control x Symptom Severity	.70	-.02
Locus of Control x Number of Symptoms	.80	.01

APPENDIX H : SUMMARY DATA OF MULTIPLE REGRESSION ANALYSES BETWEEN OBJECTIVE HEALTH MEASURES, SELF-ESTEEM, AND SUBJECTIVE HEALTH B

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health B	Physicians' rating		.34	-	54.03	.01
	Self-esteem	102	.41	.062	10.59	.01
	Self-esteem x physicians' rating		.44	.038	6.94	.01
	Functional limitations		.24	-	32.39	.01
	Self-esteem	102	.35	.107	16.53	.01
	Self-esteem x functional limitations		.35	.003	0.55	n.s
	Symptom severity		.22	-	29.37	.01
	Self-esteem	102	.28	.058	8.19	.01
	Self-esteem x symptom severity		.28	.000	0.02	n.s
	Number of symptoms		.18	-	22.34	.01
	Self-esteem	102	.24	.059	7.85	.01
	Self-esteem x number of symptoms		.24	.001	0.22	n.s

APPENDIX I : SUMMARY DATA OF MULTIPLE REGRESSION ANALYSES BETWEEN OBJECTIVE HEALTH MEASURES, LOCUS OF CONTROL AND SUBJECTIVE HEALTH B

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health B	Physicians' rating		.35	-	52.21	.01
	Locus of control	97	.35	.001	0.14	n.s
	Locus of control x physicians' rating		.36	.012	1.77	n.s
	Functional limitations		.23	-	28.96	.01
	Locus of control	97	.23	.000	0.28	n.s
	Locus of control x functional limitations		.28	.052	6.84	.01
	Symptom severity		.25	-	33.64	.01
	Locus of control	97	.27	.012	1.64	n.s
	Locus of control x symptom severity		.27	.002	0.29	n.s
	Number of symptoms		.21	-	25.99	.01
	Locus of control	97	.22	.008	1.00	n.s
	Locus of control x number of symptoms		.22	.000	0.001	n.s

APPENDIX J : SUMMARY DATA OF MULTIPLE REGRESSION ANALYSES BETWEEN SUBSIDIARY OBJECTIVE HEALTH MEASURES, SELF-ESTEEM AND SUBJECTIVE HEALTH B

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health B	Self-care limitations		.13	-	15.90	.01
	Self-esteem	102	.26	.131	17.89	.01
	Self-esteem x self-care limitations		.26	.000	0.11	n.s
	Physical activity limitations		.21	-	27.94	.01
	Self-esteem	102	.31	.094	13.78	.01
	Self-esteem x physical activity limitations		.31	.002	0.33	n.s
	Mobility limitations		.16	-	20.10	.01
	Self-esteem	102	.28	.117	16.44	.01
	Self-esteem x mobility limitations		.28	.002	0.35	n.s
	Social role activity limitations		.25	-	34.75	.01
	Self-esteem	102	.37	.122	19.69	.01
	Self-esteem x social role activity limitations		.38	.010	1.61	n.s

APPENDIX K : SUMMARY DATA OF MULTIPLE REGRESSION ANALYSES BETWEEN SUBSIDIARY OBJECTIVE HEALTH MEASURES, LOCUS OF CONTROL AND SUBJECTIVE HEALTH B

Dependent Variable	Independent Variable	N	R^2	R^2 Change	F	P
Subjective Health B	Self-care limitations		.10	-	11.70	.01
	Locus of control	97	.11	.005	0.53	n.s
	Locus of control x self-care limitations		.15	.037	4.19	n.s
	Physical activity limitations		.23	-	28.82	.01
	Locus of control	97	.23	.002	0.26	n.s
	Locus of control x physical activity limitations		.25	.017	2.12	n.s
	Mobility limitations		.14	-	16.61	.01
	Locus of control	97	.14	.001	0.12	n.s
	Locus of control x mobility limitations		.17	.029	3.42	n.s
	Social role activity limitations		.25	-	32.31	.01
	Locus of control	97	.25	.002	0.33	n.s
	Locus of control x social role activity limitations		.32	.069	9.66	.01