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The meaning of self-assessed health

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THE MEANING OF SELF-ASSESSED HEALTH: COMPARISON OF A MULTIDIMENSIONAL AND GLOBAL MEASURE

by

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DISSERTATION

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This project is dedicated to my wife, Sonia R. Preston, who has inspired this work so much, and remained steadfastly in support of me during the long hours and many revisions this paper has taken; and to my daughter, April Lee, who endured so many lost hours of spending time with her, I give my everlasting thanks and apologies.

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Abstract

The Meaning of Self-Assessed Health: Comparison of A Multidimensional and Global Measure.

By Steven Dean Preston

Recent studies have demonstrated that a personns assessment of their health is capable of estimating the likelihood of future mortality. However, little is understood concerning which variables are associated with a person's assessment of their health. This paper explores this issue through analysis of the relationship between demographic, socioeconomic, psychosocial, and health behaviors, health dimensions, general health perceptions, and self-assessments of health.

A sample of 2210 adult working men and women were selected from the RAND Health Insurance Experiment conducted in 1977-82. The sample is representative of a "normal" working population, aged 25 to 62, from three regions of the United States with a proportional distribution by gender, minority status and socioeconomic status.

Hierarchical ordinary least squares regression was used to isolate predictors of self-rated health, each of three health dimension, and general health perceptions. These predictors were compared across regression equations on the basis of statistical significance of the variable and the proportion of the total variance explained accounted for by each dimension. Comparative path models were constructed to indicate relative associations between various components of the final model.

Results indicated that health assessments are most associated with social structural variables (i.e. age, male status, nonwhite status, and education), psychosocial factors (i.e. life stress), and certain health behaviors (i.e. exercise level), with an R^2 of 17.2. The health dimensions increased the explained variance for self-ratings of health by a value of 10.5 percent beyond the previous predictors. In addition, general health perceptions, operating through mechanisms similar to the other health dimensions, added 13.0% to the explained variance for a total R^2 of 40.7.

Within the context of a working age and employed sample, it appears that health assessments are primarily associated with social structural variables and assess to certain social resources. Psychosocial health dimensions and general health perceptions, while often associated with social identities add to the health assessment process. Implications of these findings are that a persons health assessment may include components beyond health-related inputs. Therefore, program and policies must assess a persons social identity and adequacy of an individual's resources, as well as their health perceptions when conducting health interventions.

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CHAPTER 1

Perceptions of Health: A Review of the Literature

Measures of health status traditionally concern distinctions between "normal," conditions that are most generally distributed, and "pathological" deviations from the norm (Durkheim, 1897/1951). Norms for physical, mental and social function - the usual categories of functional status- are identified (or derived) and illness is defined as "a state of disturbance in the normal functioning of the total human individual including both the state of the organism as a biological system, and of his personal and social adjustments" (Parsons 1951, p.431). This functionalist perspective has enjoyed wide acceptance in the health field. (See Caplan, Engelhardt and McCartney (1981) for an excellent conceptual review of other definitions of health). Health status measures often focus on identifying and assessing undesirable deviations from the expected activities or perceptions that constitute usual daily life.

Utilizing the model presented, this study provides an extension of the limited research findings available in exploring the meaning of self-assessed health. The factors incorporated into this study not only mimic those utilized previously, but in addition, include measures of health which approximate the physical, mental and social (i.e. role functioning) aspects of health which various authors have shown to be related to conceptualizations of health. The stated purpose of this study is to gain insight into the relationship between various independent predictors, health dimensions, health perceptions and self-rated health.

Health Status as a "norm"

Health status has been theoretically conceptualized as a multidimensional construct composed of physical, mental, role functioning, social and general health components (Greenfield & Nelson, 1992). Each of these components has morbidity and mortality outcomes, as well as self-reported outcomes of health: each with their own meanings and relationships to other factors. The complexity of this conceptualization, however, has prevented agreement on a definition of who falls within the realm of healthy as opposed to those within the realm of being ill. Still, almost everyone agrees that some are "well" and others are "ill", and that relative levels of both "wellness" and "illness" exist.

Disease is defined in terms of objective pathology, while illness is generally defined as the subjective experience of symptoms (Fitzpatrick, 1986a). Moreover, it is generally assumed that absence of disease is the norm, but community studies indicate that about three-quarters of the population will say they have symptoms, but only a third of these will seek medical advice (Scambler, 1986). If illness is the norm and medical referral the exception, then there are other processes involved which depend on what is meant by normality. This may be quantitative, in that the prevalence of a condition is low in one place and therefore seen as abnormal, but high in another place and therefore viewed as normal. Quantitative normality may also be

defined statistically by a person's position on a normal distribution curve for such measured attributes as blood pressure (Fitzpatrick, 1986b). Abnormality is defined by the cut-off point on the curve at which someone's blood pressure is considered too high, at which point, they are said to have hypertension.

The interpretation of this at the individual level may have different meanings quantitatively, depending on various social structural and social psychological factors. For example, a person from a working-class background may feel that the general malaise and feelings of fatigue are quite normal, because s/he is used to feeling them all the time. They, therefore, see no necessity to seek medical attention because they observe no difference between themselves and their peers. This same perception of malaise and fatigue may signal to an upper-middle class person that something is wrong, because this is not the "norm" they are used too, nor is this the way their peers in general appear.

That is, the individual may "suboptimize" their health. People may perceive their health is as close to "healthy" as they are going to get, based on their own interpretation of the potential range of health, and what is the "norm" for them.

Qualitative normality is socially defined and may be related to prevalence, but it is also culturally determined (Fitzpatrick, 1986a). In some societies, obesity may be seen as desirable, whereas in others overweight is considered a

disease. In a similar vein, alcoholism may be seen as a moral weakness or a disease process in which disordered behavior results in the physical pathology of cirrhosis.

Theoretical Perspectives of Health Status

Even with variability in reference norms, it is still possible to conceptualize a state of **perfect health** as an ideal toward which people are oriented, rather than a state they expect to attain. From a biological standpoint, perfect health might be seen as a state in which every cell of the body is functioning at optimum capacity and in perfect harmony with every other cell; or a state in which each organ functions at optimum capacity and in harmony with each other organ (Baumann, 1961). From a psychological perspective, perfect health may be defined as a state where individuals perceive that they are in perfect harmony with their environment and capable of meeting any contingencies, (Maslow, 1981). From a sociological position, perfect health may be a state in which an individual's capacities for task and role performance are optimized (Parsons, 1958).

The extent of overlap between levels of illness might be relatively small if the criteria defining them are specified to only one frame of reference (e.g. biological), or if reference is made to only one group of people, and relatively large if all possible definitions and cultures are considered. Therefore, two points are crucial: first, to the extent that health is defined within the context of

group and cultural values, rather than a fixed definition, perfect health becomes a social norm (Twaddle, 1974). Second, there is a substantial area in which definitions of health and illness are subject to variability both within and among societies as compared with a smaller range at either extreme in which non-social clues are sufficiently strong to preclude the need for social definition (Twaddle, 1977). There are certain states of health or illness which are universally recognized, regardless of the societal beliefs. These extreme states allow relative comparisons of more socially-defined health and illness states both within and between societies. They permit construction of conceptual models of the cues to health self-assessments.

Self-Rated Health and Mortality

In the course of studying population's health status during the past decade a consistent finding has been reported by a number of authors wherein a single question relating to an individual's self-assessment of their health is capable of predicting mortality[1]. By asking individuals to rate their health using a multiple response scale, investigators have been able to identify a robust predictor

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1. Some format of the question, "In general, would you rate your health as excellent, good, fair, or poor?", has been utilized in the National Health Interview Survey. In 1982, the format for this question was changed to excellent, very good, good, fair or poor. Tables from the NHIS have been based on collapsing of the poor and fair categories with occasional reporting of all health assessment levels.

of mortality. This finding has held up even after controlling for demographic factors, socioeconomic status, medical diagnoses, "objective health status", physical measures, psychosocial factors and health behaviors .

Research exploring the influences on self-ratings of health has been limited. Much of this effort has focused on the relationship between mortality, health behaviors and health status.

The most notable epidemiologic research establishing factors linking health behavior to health status is the longitudinal study carried out by the Alameda County Human Population Laboratory. After identifying specific behaviors that contributed to disease in the initial study, ten years later a longitudinal follow-up of the original 1965 cohort indicated that seven health habits were associated with subsequent favorable health status and reduced mortality. These lifestyle habits were: not smoking, drinking fewer than five alcoholic beverages per day, maintaining desirable weight for height, sleeping 7-8 hours per night, exercising, eating breakfast regularly, and avoiding snacks (Berkman and Breslow, 1983).

In a similar manner, Kaplan and Camacho (1983) used data from the Human Population Laboratory to assess the association between perceived health ratings and mortality. They also found that self-rated health was robust in its ability to predict mortality, even after controlling for age, sex, entry level physical health status, health

practices, social network participation, income, education, health relative to age peers, anomie, morale, depression, and happiness.

In attempting to establish a link between self-rated health status and mortality, Mossey and Shapiro (1982) utilized data from the Manitoba Longitudinal Study on Aging to test the hypothesis that self-rated health was a predictor of mortality independent of "objective health status". Objective health status was defined as a function of the type and seriousness of conditions reported by a physician or the individual and occurrence of health problems resulting in hospitalization and/or surgery. These data were derived from summary health care claims available from the provincial health care information system. Their analysis revealed that self-reported health was predictive of mortality even after controlling for "objective health status", age, sex, life satisfaction, income and residence.

More recent studies (Idler and Angel, 1990a; Idler, Kasl and Lemke, 1990b), have further demonstrated the ability of perceived health status to estimate mortality. In two separate studies, Idler and her colleagues (1990a; 1990b) found that self-rated health was able to estimate mortality after controlling for a variety of demographic factors, socioeconomic status, medical diagnoses, and health behaviors.

In the first study, Idler and Angel (1990a) applied proportional hazards analysis to the NHANES-I epidemiologic

study and 12-year follow-up survey in their test of the predictive ability of self-reported health. Estimation of mortality was achieved, even after controlling for data derived from a comprehensive physical examination and associated medical diagnoses ascribed to the patient. However, perceived health could estimate mortality only for middle aged males, and not for elderly males or females of any age.

In the second study, Idler, Kasl and Lemke (1990b), tested the ability of self-evaluations of health status to predict mortality in two samples of elderly, noninstitutionalized adults. Data from New Haven, Connecticut and from Iowa and Washington Counties, Iowa were analyzed. Despite the utilization of extensive controls for physical health status, sociodemographic characteristics, and health risk behaviors at the beginning of the follow-up period, and use of analytic techniques taking into account the stratified sample design of the New Haven data, poor self-perceptions of health significantly increased the risk of mortality over that of those reporting excellent health status.

In a prospective study of 7725 middle-aged British men, Wannamethee and Shaper (1991) found that self-assessment of health was strongly associated with mortality based on an average follow-up of four years. Their results provide the first evidence of identifiable differences between levels of self-perceived health. For example, those reporting fair or poor perceived health were older, more likely to be manual

workers, and to smoke and drink heavily. However, their analysis failed to provide clear empirical indicators of the relative importance of various demographic factors or other variables in the construction of perceived health levels.

The National Health Interview Survey, (see Appendix A for tables), has reported differences in self-rated health status by age, sex, race, income and residential status for a number of years. However, these data are unable to adequately explore the relationship of various health dimensions on self-ratings of health.

Yet, the NHIS has been able to demonstrate a strong association between modifiable structural variables such as income and residential status and self-assessments of health. In contrast, while differences between static social structural variables such as age, sex, and race are evident, differences are greatly reduced after adjusting for income and residential status (USDHHS, 1992).

Social Structure, Psychosocial Factors and Health Status

Numerous studies have examined the direct or indirect effects on health of age, gender, socioeconomic status, and minority status, along with a wide range of other social structural characteristics. Underlying this work is the proposition that social positions evoke differential responses and prescribe differential behaviors within a group or community.

Generally, aspects of the social structure are believed to reflect or influence three categories of variables that, in turn, influence health status (Kaplan, 1989). First, social-structural factors are related to exposure to health-promoting or pathogenic circumstances. Within this study, these variables are most identified within demographic and socioeconomic dimensions. Second, these factors affect the individuals ability to resist pathological outcomes of exposure to such factors. For this study, indicators of these factors are found in the psychosocial factors, health behaviors, and mental health and general health dimensions. Third, they determine access to health care. Unfortunately, there are no indicators of health access included within this analysis[2]. The three components outlined, pathogenic circumstances, susceptibility characteristics, and access to health care, establish the onset and course of disease.

Position in the social structure influences a persons health status by inducing them to behave in ways that either promote or threaten health status and by exposing the person to social and physical environments that vary in the degree to which they are threats to psychological and physical health, (for example, noise, chemical pollution, social rejection, and risks of accidental injury).

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2. However, there are proxies which may be used to indicate likelihood of utilization of health care resources. These proxy items are included in the General Health Perceptions index.

To this regard, a persons' "social identity" is representative of the individuals social situation and the resources they may have access to[3]. Unfortunately, while much is known about health and disease differences based on social identities, little is known as to the importance these factors play in the process of health assessments.

The consequences of people's behavior for their own health may be more or less consciously intended; a person may behave without awareness of the relevance of behavior for their health or may recognize that their anticipated behavior has consequences for health status but not consider it serious enough to take action, (Berkman, 1985).

Besides the influence of the psychological stress of social rejection (e.g. sexism or racism), any of a number of maladaptive responses to stress (e.g. problem drinking, smoking, etc.) increase the risk of illness or injury. The end result is that linkages are made between health and both psychological and social stress levels (Elliott and Eisdorfer, 1982).

The environmental circumstances and personal behaviors that are shaped by social structural arrangements impact on people's vulnerability to adverse effects. For example, exposure to certain organisms would not result in full-blown disease if the person was not vulnerable to the adverse

3. Social identities may be defined as those social structural variables which incorporate a group definition within society. This "identities" may be static such as age, gender or race, or flexible such as marital status or residence.

effects. Thus, resource-poor persons may be more affected than those who have access to those resources necessary to cope with stressors.

Three studies have attempted to identify the predictors of self-rated health, each falling short of accomplishing this task. Wan (1976) used a two-stage multivariate analysis to examine factors affecting personal perceptions of health status. He found that sociomedical health indicators (e.g. measures of functional health status) were better explanatory variables of self-assessed health status than socioeconomic (e.g. income) or psychological indicators of well-being (e.g. life satisfaction). Wan's sample was restricted to individuals 58-63 in a longitudinal retirement survey, and only compared those who perceived their health as worse than others to those perceiving their health as equal to or better than others.

The second study is by Wannamethee and Shaper (1991) which presented data showing statistically significant differences for perceived health status and selected disease prevalences. They also showed differences in socio-demographics and health behaviors by perceived health status, but did not test for statistical differences, nor did they analyze the ability of these variables to predict perceived health status.

Recently, Segovia, Bartlett and Edwards (1989) examined six health practices (smoking, exercise, sleep, weight, drinking and eating breakfast) and their association with

self-assessed health status. They found that not smoking, adequate exercise and sleep, and appropriate weight for height and age were all highly associated with higher self-assessments of health status in a white middle class population. However, moderate drinkers reported better health than nondrinkers, and eating breakfast showed no association.

Even with the information gathered from these studies, little is known about the relationship of the various dimensions controlled for in the mortality studies with regard to self-rated health. What is needed is further information about the components which go into the formulation of self-ratings of health.

Creating an Health Assessment Model

Given the results presented above, certain general findings may be observed. First, although each of the studies asked the question of self-perceived health somewhat differently, (some comparing to others their age, others asked in general terms), the importance of self-rated health in estimating mortality was generally consistent and robust after adjustments for various sociodemographic factors, clinical indicators of disease, psychosocial variables, and health behaviors. Second, although each study utilized mortality as its dependent variable, none explored differences in levels of self-rated health.

What these studies have achieved is to provide evidence of the ability of self-rated health (SRH) to independently estimate mortality above and beyond a large range of other variables. Each study has failed to analyze which variables contribute to formulation of self-rated health assessments. Specifically, none of the cited studies has presented a conceptual model elucidating the self-rated health construct in terms of which variables are associated with excellent, good or poor ratings of health.

Each of the studies controlled for sociodemographic variables, clinical indicators of disease, and health behaviors as predictors of mortality- an objective outcome. The primary independent variable was the persons's health assessment- a subjective evaluation. Only Kaplan and Camacho (1983) included measures of social network participation and mental health, and concluded that "the effect of perceived health on mortality is not due to its association with other variables, particularly those related to health practices, social network participation, or psychological state" (p.299). No study has attempted to relate psychosocial factors or subjective health dimensions to self-ratings of health.

Several studies have pointed to the importance of psychosocial factors and social participation in the conceptualization of health states and evaluations of quality of life (Patrick, 1986). What is needed is empirical evidence which identifies the predictors of health

assessments, and implies how these predictors influence a person's assessment of their health. Further, as presented earlier, because health may be defined from different theoretical perspectives it is important to include these perspectives into any study which tests for potential predictors of health status.

Ware (1986) presented a model of health assessments founded on conceptual and empirical research composed of six dimensions: physical, mental, social, role functioning, general health perceptions, and symptoms. According to this model, general health perceptions are included in the overall health assessment. The physical health dimension involves biological components, but its primary ramification relates to the ability of individuals to complete their socially-defined roles and tasks, placing it more in the realm of a sociological definition of health than a biological one. Similarly, the social health dimension involves items more identifiable with the mediator factors associated with social support and networks, than as an independent health dimension (Berkman, 1985). The conceptual formulation of the self-assessment of health is presented in Figure 1.

The six health dimensions may be reconstructed into four dimensions through three modifications to Ware's (1986) model. First, reporting of symptoms, both physical and psycho-physical is to be treated as a physical (i.e. biological) dimension of health.

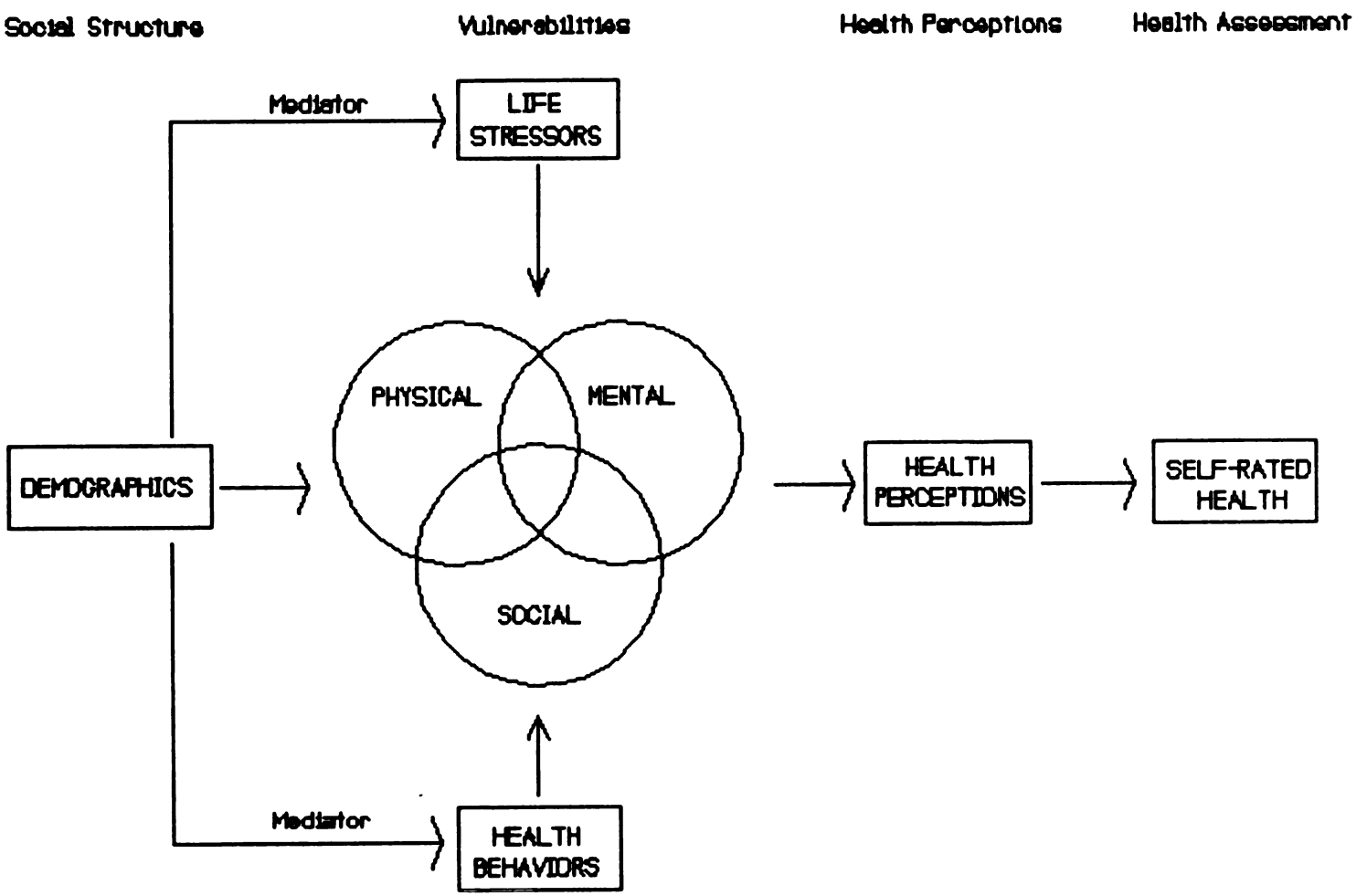


Figure 1. Conceptual Model of the Relationship Between Social Structure, Health Dimensions, and Self-Assessments of Health.

Second, the social health dimension may be treated as a mediator rather than as a health dimension in its own right. The literature suggests that associations between social relationships and health status operate through more proximal processes of physical health, mental health and role functioning. Social networks and supports provide only an important mediating effect on the ability of these other health dimensions to influence health status, (Hall and Wellman, 1985).

A third modification to Ware's model is to add a component representing the influence of social structure, (e.g. age, race, or education). This dimension was identified in the earlier discussion as being implicitly important in affecting people's health dimensions and global assessments of their health.

This revised model postulates that self-assessments of health are based on a process of health perceptions which are influenced by social, psychological and physical factors, which are themselves influenced by originating social identities. Mediating factors of life stressors and health behaviors arise from the social structural components. These in turn also affect the person's health dimensions (i.e. the physical, psychological and social conditions.

This study will compare a multidimensional measure of health (i.e. general health perceptions) with a global measure (i.e. self-rated health). The comparison will test

the relative contribution of demographic characteristics, socioeconomic status variables, psychosocial factors, and health behaviors to each of these measures. These analyses will be replicated for three health measures representing physical, psychological and role-functioning health. A comparison will be made of the predictive ability of the various independent factors and health dimensions in differentiating health assessments based on the two measures. A final model will test the contribution of selected independent variables, the three health dimensions, and general health dimensions in predicting self-ratings of health.

CHAPTER 2

Methods: Predictors, Health Dimensions, And Self-Assessments of Health

METHODS

Research Questions

This study addresses how various factors contribute to self-perceptions of health. The basis of the study rests on three conceptual questions. The first question concerns the predictive relationship of demographics, socioeconomic status (SES), psychosocial factors, and health behaviors to self-rated health (SRH), the dependent variable. The second question explores the relationships of these dimensions to other self-reported health measures including personal/role functioning, mental health, general health perceptions and acute symptoms. The third question considers the contributions of independent predictors, (i.e. demographics, socioeconomic status, psychosocial factors, and health behaviors), and health dimensions, (i.e. personal/role functioning, mental health, symptoms and general health perceptions), to self-rated health. Each question is explored in some depth to provide a better understanding of the meaning behind the concept of self-rated health status. These three questions build upon each other to form a complete analysis.

The outcomes of the analyses of the first two research questions provide the legs on which the central question (i.e. question #3) of this paper rests: the associations between the independent predictors, health dimensions, and self-rated health. Important independent predictors of self-rated health are identified in the first two questions

which will then be included in the model to be tested in question three.

Research Question #1. What is the contribution of demographic factors, socioeconomic status, psychosocial factors, health behaviors to self-rated health?

This question identifies important nonhealth predictors of self-rated health. The dependent variable, self-rated health, is based on an answer to the question: "In general, would you say your health is excellent, good, fair or poor?". The independent variables are grouped into four dimensions of demographics (age, sex, race, marital status, and rural residence), socioeconomic status (education, occupation, and income), psychosocial factors (life events and social network), and health behaviors (smoking, drinking, obesity, and physical activity level).

Research Question #2A. What is the contribution of demographic factors, socioeconomic status, psychosocial factors and health behaviors to personal/role functioning, mental health, symptoms, and general health perceptions? 2B. To what extent are the predictors similar across these four health dimensions?

These research questions identify relative similarities and differences in the predictors of health when health is defined in alternative ways, based on the independent variables identified in the first question.

Four health dimensions each assess various aspects hypothesized to comprise an overall perception of health.

As stated previously, self-rated health is conceptualized as comprising overlapping physical, psychological, social and metaphysical dimensions which interact to define an overall assessment of health within temporal and situational constraints. It is for this reason that measures of acute symptoms, mental health, and personal/role functioning, are compared. Within this study, the number of acute symptoms reported represents the physical dimension; mental health reflects the psychological dimension; and personal/role functioning represents the social dimension. Regrettably, the metaphysical dimension is beyond the scope of potential investigation within this study.

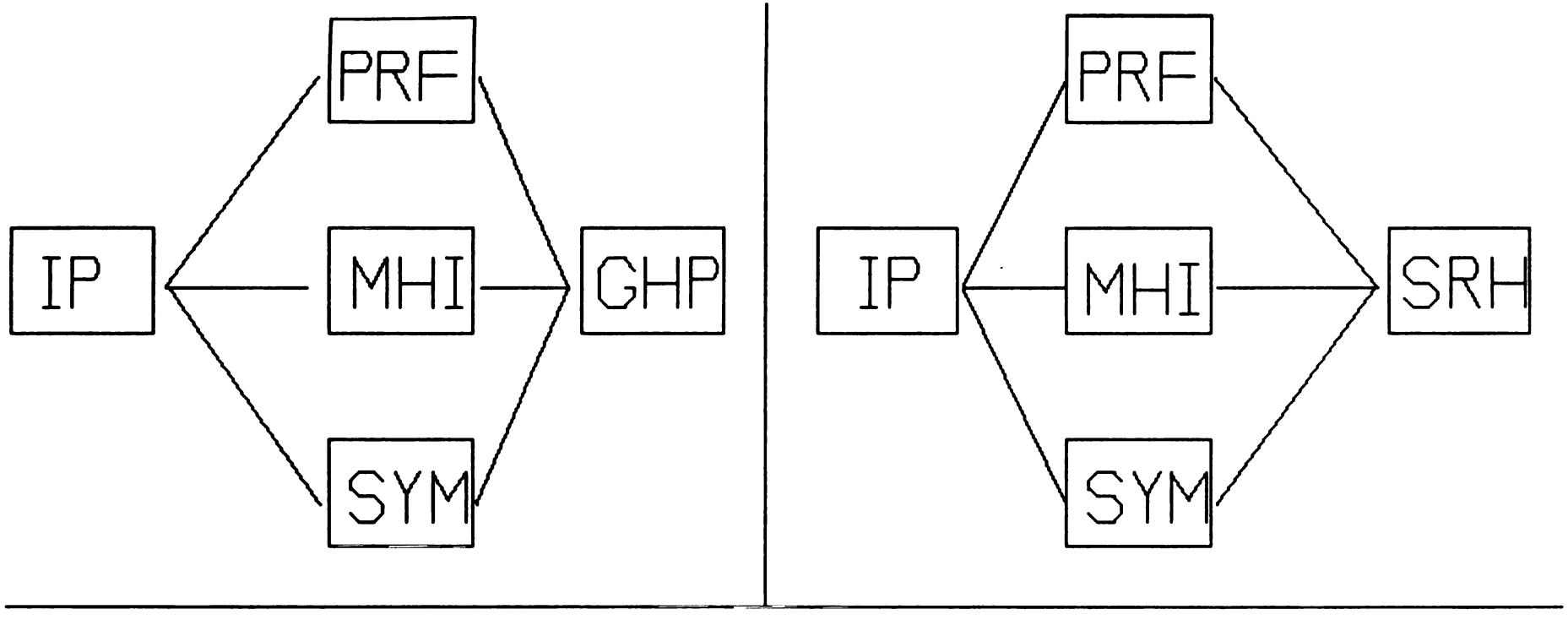
General health perceptions are viewed as a potential alternative for self-rated health. These perceptions may provide a focal point for the physical, mental and personal/role functioning health dimensions relationship to self-rated health. That is, a persons perceptions within the three health dimensions (physical, mental, and social) may strongly influence his/her general health perceptions, or health perceptions may be formed from other factors.

Research Question #3A. Are general health perceptions and self-rated health equivalent, or do general health perceptions provide additional information in explaining the variance in self-rated health? 3B. What comparative contribution do the identified independent predictors, the three health dimensions, and general health perceptions make to self-rated health?

The comparison between the models in which general health perceptions (GHP) and self-rated health (SRH) are dependent variables tests whether self-rated health is a single variable proxy which replicates the composite General Health Perceptions Index. The comparison consists of construction of path models which demonstrate the relationship of the PRF, MHI and SYM health dimensions to both GHP and SRH (Figure 2). In Figure 2, the Independent Predictors (IP) are those variables within the independent predictor dimensions (i.e. demographics, socioeconomic status, psychosocial factors, and health behaviors) which were found to be statistically predictive of self-rated health by the question #1 analysis.

Equivalency of the models in Figure 2 consists of comparison of the R^2 paths in each model, and comparison of the proportion of variance explained by the independent predictors and health dimensions. This procedure is more explicitly outlined under the analysis plan for this question.

Should results demonstrate that PRF, MHI and SYM (representing the biological, psychological and social dimensions of health) are equivalent between GHP and SRH, no further analysis is necessary. This finding would indicate self-rated health is a single item proxy of general health perceptions and would provide evidence of the relative importance of the independent predictors and health dimensions to each dependent variable.



IP = Independent Predictors
PRF = Personal/Role Functioning
MHI = Mental Health Index
SYM = Acute Symptoms Reported
GHP = General Health Perceptions
SRH = Self-Rated Health

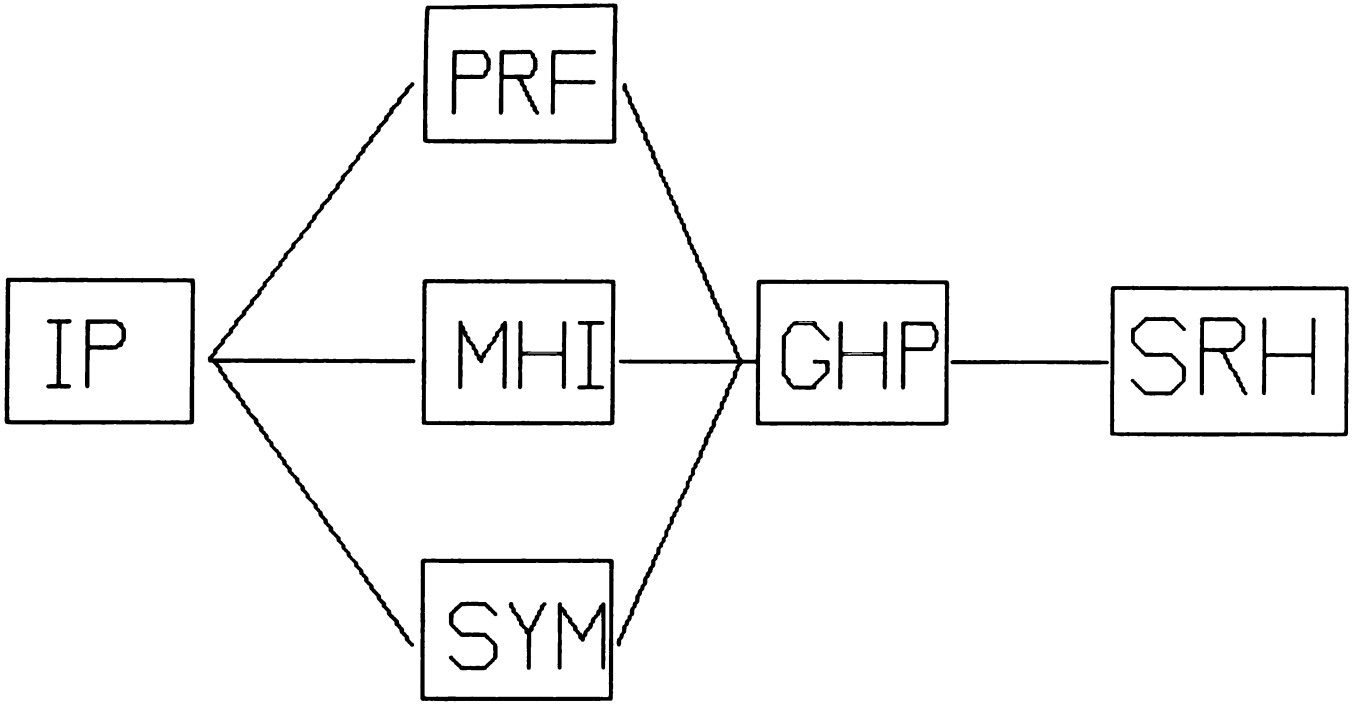
Figure 2. Comparison of Path Models for General Health Perceptions and Self-Rated Health.

In contrast, if the two path models are not equivalent, then an alternative path model will be tested as presented in Figure 3. This final path model considers general health perceptions as a separate dimension of health which provides additional information beyond that of the physical, psychological and social health dimensions, and therefore needs to be included as an additional predictor dimension of self-rated health.

This alternative path model utilizes a framework similar to that described for Figure 2. The primary difference for this path model is that general health perceptions is treated as a third stage predictor of self-rated health, beyond the independent predictors and three health dimensions previously entered into the model.

The second part of this question concerns the overall comparison of relative contributions which the independent predictors, health dimensions, and general health perceptions make to self-rated health. The analysis conducted for this portion of the question will address the relative importance of various influences (i.e. social structural, personal health dimensions, and general health perceptions) in explaining health assessments.

This will provide the apex of the current study by providing empirical evidence for which areas most influence health assessments. Discussion of results for question three will focus on the feasibility of directing resources toward the most influential areas, and how these resources



IP = Independent Predictors
PRF = Personal/Role Functioning
MHI = Mental Health Index
SYM = Acute Symptoms Reported
GHP = General Health Perceptions
SRH = Self-Rated Health

Figure 3. Alternative Path Model of Health Dimensions, General Health Perceptions, and Self-Rated Health.

may be utilized to make improvements in the health assessments of individuals.

Sample Population

The sample used for this study is selected from a population of respondents in the Rand Corporation Health Insurance Experiment (HIE) conducted between November 1974 and January 1982. The HIE was a randomized trial designed to study the effects of health insurance generosity on the demand for health services and the health status of persons. Between November 1974 and February 1977, the HIE enrolled families in five sites: Seattle, Washington; Fitchburg, Massachusetts; Franklin County, Massachusetts; Charleston, South Carolina; and Georgetown County, South Carolina[1]. In each site, families enrolled for either 3 or 5 years. Participating families were assigned to 1 of 14 different fee-for-service insurance plans. All plans provided broad coverage for the same inpatient and outpatient medical services, with differences primarily in the percentage of insurance coverage. Families were assigned to experimental plans using the Finite Selection Model (Morris, 1979).

The HIE sample was a random sample of each site's population, with the following groups being ineligible: 1) those persons 62 years of age and older at the time of

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1. Subjects from Dayton, Ohio are excluded because they were administered different questionnaires during the pilot phase of the Health Insurance Experiment.

enrollment; 2) those persons with incomes in excess of $35000 in 1973 (equivalent to $85,000 in 1985) - this excluded 3% of the families contacted; 3) those individuals eligible for the Medicare Disability program; 4) those individuals in jails or institutionalized for indefinite periods; 5) persons in the military or their dependents; and 6) veterans with service-connected disabilities.

The Rand HIE data set was used for a number of reasons. The HIE includes a variety of socioeconomic indicators. Many of these are common to those used in other studies, while others are unique. The fact that the person is the unit of analysis of the HIE allows direct linkage of SES variables with health status and lifestyle variables. The HIE includes measures conceptualized in this study to be predictive of self-rated health: social structure variables, health dimension variables, mediating variables (e.g. life stressors and health behaviors), and general health perceptions. Further, the HIE utilizes questionnaires which have been rigorously tested for both external and internal validity for each of these measures. In essence, the HIE is a well-balanced random sample data set whose original purpose does not interfere with the analyses intended.

Measures of Variables to be Studied

The categories and coding for all independent variables used in the analyses are presented in **Table 1.** Independent variables are divided into four dimensions: 1) Demographics;

2) Socioeconomic Status (SES); 3) Psychosocial factors; and 4) Health Behaviors. All variables included in the analyses are by self-report.

The demographic variables include three variables which are static (age, sex, and nonwhite status), and two which are modifiable (marital and residential status). The socio-economic status variables incorporate all three standard SES variables in an effort to assess the relative strength of their association with health assessments.

The psychosocial factor predictors are composed of two indexes which measure the number of stressful life events and social network available to potentially provide support. The Social Participation/Network Index is defined in terms of interpersonal interactions and activities indicating social participation[2]. Items covered include such social activities as visiting friends, church attendance, and involvement in neighborhood activities or other groups or clubs.

The Life Stress Index was computed by the relative accumulation of stressful events related to a number of life circumstances. Items of life stress included issues such as: frequent arguments with significant others, marriage,

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2. It should be noted that the Social Network Index is not equivalent to a social support scale. The index provides no indication of the importance of social contacts available to the interviewee. Nor does it provide any information as to whether study participants feel that they have a social support network, or if they have a feeling of social support.

divorce, changes in job or personal responsibilities, and death of significant others, along with other items[3].

The health behavior predictors include measures of four health behaviors previously identified as affecting health states and mortality (Kaplan and Camacho, 1983). Smoking and obesity have both been shown to have detrimental effects on health. Exercise or other physical activity has been found to have positive health effects. Alcohol intake has been shown to have mixed results.

The health dimensions measured by the mental health (MHI), personal/role functioning (PRF), and general health perception (GHP) indices are comprised of a series of questions calculated into a total score and transformed to 100 point scales. Each scale provides an indication of the participants condition at the time of enrollment into the study. Higher values on the overall mental, PRF and GHP scales indicate healthier conditions. More detailed descriptions of the Personal/Role Functioning, Mental Health, Social Network and General Health Indices are described elsewhere (Brook et al, 1979; Ware et al, 1980; Davies and Ware, 1981). Index items are presented in Appendix B.

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3. Although this scale meets face and construct validity criteria, it has not been pre-tested, nor is it directly comparable to other life stress scales (e.g. the Holmes and Rahe Social Readjustment Scale, 1967), even though it contains many of the same conceptual items and domains.

Table 1. Independent Variable Descriptions and Coding.

Variable	Description	Coding
Demographics		
Age	age at enrollment;	Continuous;
Sex	self-reported gender;	0=Female; 1=Male
Race	racial status	0=White; 1=NonWhite
Married	married with spouse present;	0=NonMarried; 1=Married
Rural	residential status	0=Urban; 1=Rural
Socioeconomic Status		
Education	years completed at time of enrollment;	Continuous;
Occupation	defined by codes in 1970 U.S. Census Index of Industries and Occupations;	0=Profesionals; 1=Managers; 2=Clerical; 3=Craftsmen; 4=Operatives; 5=General Laborers;
Blue Collar	defined as occupation codes 3,4, or 5;	0=White Collar; 1=Blue Collar
Income	family income for year preceding enrollment (1973 dollars);	Continuous;
Psychosocial Factors		
Life Stress	a composite measure of thirteen life events, (See Appendix B)	Continuous; High score indicates more stressors
Social Network	a measure of frequency of social contacts, group participation and number of social resources available able (See Appendix B)	Continuous; High score indicates increased social participation and contacts

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Variable	Description	Coding
Health Behaviors		
Smoker	Self-reported Smoking Status	2=Current Smoker; 1=Former Smoker; 0=Never Smoked
Ever Smoked	Combined Current and Former Smoker Status	1=Ever Smoked 0=Never Smoked
Drinker	Self-reported Drinking Status	2=Problem Drinker; (Self-identified) 1=Moderate Drinker; 0=Never Drinks
Any Alcohol	Combined Problem and Moderate Drinker Status	1=Any Alcohol; 0=Nondrinker
Exercise	Self-reported overall physical activity:	3=Little Exercise: sitting and walking mostly; 2) Fairly active: physically, moderate - strenuous activity several times/week; 1) Quite active: physically, at least moderate activity every day; 0) Very active: physically strenuous activity most days
Obesity	defined as a Quetelet index greater than or equal to 28 kg/m2	0=NonObese; 1=Obese

0=Referent Category

The Personal/Role Functioning Index (PRF) measures an individuals overall ability to perform self-care, mobility, physical activities and limitations (acute or chronic) in role activities to which the individual had been subject for

some period preceding the interview. Higher scores indicate a better functioning level. The PRF is an index which combines both physical and role functioning[4].

The Mental Health Index (MHI) measures the individual's mental health by combining measures of anxiety, depression, and psychological well-being based on the frequency and the intensity of symptoms during the preceding month. Higher values indicate better mental health; more pronounced feelings of psychological well-being and freedom from feelings of anxiety and depression.

The third dimension of health is measured by the number of acute symptoms that the respondent experienced during the 30 days preceding the interview. Higher values indicate a greater number of acute symptoms reported. Symptoms range from minor complaints of headaches and allergy reactions to major chest pain or bleeding. Unfortunately, it is not possible at this time to divide the index into minor and major symptoms categories. Appendix B lists the possible symptoms queried. Coding for each of these variables is described in Table 2.

Last, the General Health Perceptions index (GHP) measures individual's perceptions of their health in general

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4. The Personal/Role Functioning Index is not weighted for the sub-dimensions of activities of daily living and role functioning. It also does not take into consideration the specific roles which the person is attempting to fulfill. For example, a paraplegic computer programmer may have as high or higher an index score than a construction worker with asthma.

Table 2. Health Dimension Coding Structure.

Health Dimension	Measure	Items	Type	Range
Social	Personal/Role Functioning Index (PRF)	36	Ordinal	0-5
Psychological	Mental Health Index (MHI)	37	Continuous	0-100
Physical	Acute Symptoms (SYM)	23	Interval	0-23
General	General Health Perceptions Index (GHP)	22	Continuous	0-100

Note: Independent variables are described in Table 1.

at the time of interview. Higher values indicate more favorable perceptions of health in the past, present, and future, less health-related worry, and greater perceived resistance to illness. Items are listed in Appendix B.

Analysis Plan

The analyses are limited to employed persons aged 25 or over. This allows a reasonable time period to complete their education and develop relatively stable occupations

and family incomes[5]. After these exclusions, a final sample of 2210 persons was selected for analyses.

The description of the overall sample (Table 3) indicates reasonable variation in demographic factors, socioeconomic status, psychosocial factors and health behaviors. However, it should be noted that the sample is that of a working adult population raising the possibility of a "healthy worker" effect (Hennekens & Buring, 1987). That is, the health dimensions may be biased due to the fact that individuals must be at least at a minimum level of health to be gainfully employed.

Due to the previously recognized confounding between age and almost any variable relating to health (House, Kessler and Herzog, 1990), all analyses will be presented as age-adjusted results. Age-adjustment for both nominal and ordinal variables is based on categorization of the sample distribution into four age categories: 25-34; 35-44; 45-54; and 55 and older. Standardization is performed using a Mantel-Haenszel (1959) procedure which computes a pooled summary chi-square statistic. Age-adjustment for all other analysis will consist of controlling for age through regression analysis techniques.

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5. Housewives and the unemployed have been excluded due to difficulties in classification of their income and occupational status. Moreover, the intention of this study is the examination of a "normal" adult working population, such that inclusion of these populations may introduce conflicting health perspectives, (Pill and Stott, 1982).

Table 3. Sample Description

	Percent	N
Socio-Demographics		
Female	39.9	881
Non-White	15.8	350
Married	74.7	1650
Rural Residence	23.9	528
Occupation		
Professionals	20.0	443
Managers	17.2	380
Clerical	18.0	397
Craftsmen	16.1	356
Operatives	14.7	325
Laborers	14.0	309
Health Behaviors		
NonSmokers	40.7	899
NonDrinkers	26.3	582
Quite/Very Physically Active	37.7	834
Obesity (BMI GE 28.0)	17.3	382
Primary Dependent Variable		
Self-Reported Health		
Excellent	35.5	785
Good	55.9	1235
Fair/Poor	8.6	190

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Table 3. Sample Description (Continued)

Variable	Mean	S.D.	Range
Age	38.6	10.40	25-61
Education	12.8	3.16	0-25
Family Income (1973 $)	12,176	5343.5	99-32263
Social Network Index	49.9	16.00	0-97
Life Stress Index	7.5	5.20	0-27
Health Dimension Dependent Variables			
Symptoms reported (Past 30 days)	2.6	2.40	0-23
Personal/Role Functioning Index	4.5	1.04	0-5
Mental Health Index	75.9	12.56	17-100
General Health Index	71.3	14.18	15-100

Research Question #1. What is the contribution of demographic factors, socioeconomic status, psychosocial factors, health behaviors to self-rated health?

Analysis of this first question consists of two levels. First, age-adjusted chi-squares will be computed for all nominal and ordinal level independent variables using the Mantel-Haenszel pooled estimate technique. The dependent variable will be three levels of self-rated health (i.e. excellent, good, poor/fair). For the continuous independent variables, age-adjusted mean values for each level of self-rated health will be compared using analysis of covariance

(ANCOVA). All variables used in this analysis are described in Tables 1 and 2.

The second analysis will consist of application of hierarchical ordinary least squares (OLS) regression to compare the ability of each individual dimension to predict self-rated health and to test the relative contribution of each dimension to self-rated health. Separate hierarchical regressions will be tested for demographic, socioeconomic status, psychosocial factors and health behavior variables. In addition, an overall model will be tested including all independent variables.

Variables will be entered into the overall model in the following order: demographics, socioeconomic status, psychosocial factors, and health behaviors. This order represents the conceptual organization of processes involved in the assessment of health states in this study. Demographic variables are first entered as background variables. Socioeconomic status is entered as representation of current social position. Next, psychosocial factors representing mediating factors related to sociodemographic inputs are entered. Health behaviors are entered last; representing observable reactions to the psychosocial factors.

For each OLS regression, self-rated health is treated as a continuous variable even though potentially violating one of the assumptions of multiple linear regression. Shott (1990), however, states that as long as the dependent variable is approximately normally distributed, then OLS

regression is permissible, given an adequate sample size. Since self-rated health is minimally skewed (-.225), and the sample size is sufficiently large, it may be assumed that the OLS regression model does not violate any assumptions.

Research Question #2A. What is the contribution of demographic factors, socioeconomic status, psychosocial factors and health behaviors to personal/role functioning, mental health, symptoms, and general health perceptions? 2B. To what extent are the predictors similar across these four health dimensions?

For the first part of question two, hierarchical multiple regression analysis performed for each of the four dependent variables (Personal/Role Functioning-PRF, Mental Health-MHI, Symptoms-SYM, General Health Perceptions-GHP) will be identical to that conducted for question #1. Separate hierarchical OLS regressions will be computed for the demographic, socioeconomic status, psychosocial factor, and health behavior predictors. In addition, overall models will include all variables at once for each dependent variable.

For the second part, comparison of the hierarchical regression models for each health dimension will be based on three methods. First, a comparison of the statistically significant independent predictors between the four dependent health dimensions will be made. Second, for each dependent variable the R^2's will be compared for each independent dimension of demographic factors, socioeconomic

status, psychosocial factors, and health behaviors. Third, the proportion of the explained variance accounted for by each independent dimension will be compared across the two models.

Research Question #3A. Are general health perceptions and self-rated health equivalent, or do general health perceptions provide additional information in explaining the variance in self-rated health? 3B. What comparative contribution do the identified independent predictors, the three health dimensions, and general health perceptions make to self-rated health?

Analysis for these questions consists of construction of comparative path models. The first part of this question consists of a model comparison to test the equivalency of the general health perceptions (GHP) dimension and the primary dependent variable, self-rated health (SRH). The analysis consists of construction of path models (Figure 2) to compare the relationship of the PRF, MHI and SYM health dimensions to GHP and SRH.

For each of the separate models constructed, R^2's derived from questions #1 and #2 will be utilized within the Figure 2 models. All paths will be controlled for other health dimensions included in the model and for any individual variables identified as predictive from the analyses performed under questions #1 or #2. Using hierarchical regression models, path coefficients are derived from the change in R^2 for each subsequent

hierarchical step, utilizing a method described by Li (1976).

Criteria for selection as an independent predictor is statistical significance in three out of the four Model 5 regressions in Tables 8-11, and significance at the .001 level due to the large sample size. Significant independent predictors identified within questions #1 and #2A/B will be entered first. This will produce the change in R^2 for the Independent Predictors.

In the second step, two of the three health dimensions (personal/role functioning, mental health, or symptoms) will be entered into the equation, and the change in R^2 will provide the amount of variance explained by the controlled health dimensions. Then, in the third step, the remaining health dimension will be entered. This will provide the additional R^2 that the health dimension adds to the overall model. Values in parentheses under each of the three health dimensions will represent the change in R^2 for the health dimensions controlled for by the second hierarchical regression equation. Separate hierarchical regression models will be computed for each dependent variable (i.e. self-rated health and general health perceptions), and presented in comparative form in Figure 4.

Construction of the paths for the alternative path model in Figure 3, will be similar to that described above for Figure 2. With a dependent variable of self-rated health (SRH), independent predictors will be entered first.

Then two of the three health dimensions, (personal/role functioning, mental health, or symptoms) will be entered into the regression equation. Next, the excluded health dimension will be added to the equation in the third step. Last, the general health perceptions index will be entered as a fourth step. This process will be repeated for each of the three health dimensions. Results for the alternative health model, if Figure 4 demonstrates non-equivalency, will be presented in Figure 5.

Total R^2's will be utilized to compare the two models. Comparisons will also be made on the basis of the relative proportions of variance explained derived from three parts of each model. First, comparison of the relative proportion of variance explained attributed to the Independent Predictors (IP) for each dependent variable will be made. Second, comparison of the R^2's for each path linking the individual health dimensions and the dependent variable will be made. Third, comparison of the proportion of variance explained attributed to the health dimensions as a whole for each dependent variable will be made. The combined health dimension R^2 will be calculated by adding the R^2's for the paths between each health dimension and the dependent variable.

In summary, the research questions and analyses presented above are concerned with three areas:
1) identification of relationships between various identified independent predictors and self-rated health;

2) how the independent predictors differ between the three health dimensions, general health perceptions, and self-rated health; 3) after adjusting for significant independent predictors, the influence of various health dimensions on self-rated health. The final analysis will provide a clearer understanding of the meaning of self-perceptions of health.

CHAPTER 3

Results: Self-Rated Health Models Analysis

RESULTS

The analysis of the three research questions previously outlined will be presented to show the predictors of self-assessments of health and how they differ from other health dimensions. These results will show the associations between the health dimensions and self-ratings of health. Results from questions one and two form the foundational legs supporting the final analysis. Question one replicates the findings from the literature regarding the association of the independent dimensions to self-rated health. The results describe how the independent predictor dimensions (i.e. demographics, socioeconomic status, psychosocial factors, and health behaviors) predict self-rated health. Question two elucidates similarities and differences of these independent predictors for the health dimensions. Question three then explores an overall model of the associations between the health dimensions and self-rated health, controlling for independent predictors identified.

Research Question #1. What is the contribution of demographic factors, socioeconomic status, psychosocial factors, and health behaviors to self-rated health?

Results are presented in Tables 4 and 5. Results within this question reveal that age, minority status, and education are three of the most consistantly important factors associated with higher ratings of health. Table 4 indicates that for the continuous sociodemographic and psychosocial factor variables, there is a clear separation

Table 4. Selected Means for Self-Rated Health Comparisons[1]. (Adjusted for Age and Sex)

Variable	Poor/Fair	Good	Excellent	F Value[3,4]
Sociodemographic Factors				
Age[5]	44.8 (10.93)	39.4 (10.52)	36.0 (9.22)	63.3
Income	10590 (5337)	11896 (5330)	13000 (5240)	33.8
Education	10.0 (3.44)	12.6 (2.94)	13.9 (2.90)	109.6
Psychosocial Factors				
Life Stress[2]	32.2 (6.02)	25.5 (5.22)	22.9 (4.8)	34.6
Social Index[2]	48.7 (17.61)	49.1 (15.57)	51.3 (15.20)	9.0

1 Life Stress and Social Index, are scaled as 0 to 100;
2 High Values: Life Stress = high value equals worse;
Social Index = high value equals better.
3 All F-values significant at $p < .001$.
4 Post-Hoc Student-Neuman-Keuls comparisons differentiate each level from each other at $p < .05$ for all analyses.
5 Adjusted for sex only.

between the three levels of health. A stepwise progression shows that increasing income, education, and social index scores differentiate those reporting poor or fair, good, and excellent health. Similarly, increasing age and life stress scores statistically differentiate the three health levels. As noted in Table 4, these individual level differences remain even though adjusted for age and sex.

The age-adjusted categorical variables in Table 5 generally confirm the Table 4 findings[1]. Within the categorical sociodemographic variables in Table 5, females, nonwhites, rural residents and blue collar workers progressively report decreasing percentages of good or excellent health compared to poor or fair health.

For the age-adjusted health behaviors, current smoker status is associated with a higher liklihood of reporting poor/fair health status. This pattern is also found for those categorized as obese. Moderate drinkers haver a greater likelihood of excellent health than of poor health. This same pattern is seen for those reporting "any alcohol" intake status. This latter result for any alcohol intake is most likely due to the small percentage of problem drinkers in the study[2].

Last, those reporting they partake in little or no exercise or physical activity are less likely to report higher levels of health compared to the referent very active

1. What is of interest is that certain findings do not support empirical evidence reported in the literature. For example, no association is found between marital status and health level, even though this has been indentified in other studies (House, Robbins, and Metzner, 1982). However, the absense of an association for this study is most likely due to the large percentage of married in the sample, as well as marital status is treated here as a dichotomous variable.

2. It is quite likely that the findings for both smoking and drinking status are also effected by the format of the coding of of the data. It would also be desirable to have independent physiological measures when tend to provide more consistent results (Felding, 1992; Rankin and Ashley, 1992), but these are difficult to acquire even in the best of empirical studies.

Table 5. Age-Adjusted Mantel-Haenszel Chi-Squares for Socio-Demographic and Health Behavior Variables.

Variable	Poor/Fair	Good	Excellent	X^2	P Value
Sociodemographic Factors					
Female	49.5%	43.0%	32.6%	29.6	.000
Nonwhite	37.4%	17.0%	8.8%	96.6	.000
Non-Married	23.7%	26.9%	23.3%	3.5	.171
Rural	41.6%	24.8%	18.2%	47.1	.000
Blue Collar	84.7%	65.5%	53.1%	74.5	.000
Health Behaviors					
Smoking:					
Ever Smoked	63.7%	59.8%	57.5%	2.8	.250
Current Smoker	41.6%	38.9%	32.1%	8.0	.019
Former Smoker	22.1%	20.9%	25.4%	1.6	.457
Alcohol:					
Any Alcohol	56.8%	72.7%	79.2%	40.9	.000
Moderate Drinker	42.1%	62.3%	70.6%	51.2	.000
Problem Drinker	14.7%	10.4%	8.7%	0.6	.731
Weight & Exercise:					
Obesity (> 28 Kg/M^2)	24.7%	18.5%	13.6%	15.9	.000
Little Exercise	33.7%	27.2%	18.0%	24.5	.000
Fairly Active	31.6%	38.1%	38.7%	7.4	.025
Quite Active	26.3%	28.1%	32.9%	3.4	.186

participants. Those at the next highest level, (i.e. fairly active), show a reversal of this pattern, and a progressively increased proportion report higher health levels. This trend of increased likelihood of better health is also seen for the quite active group, although it cannot be statistically differentiated from the referent group[3].

Standardized beta coefficients in Table 6 for model 1 (Demographics) show that age, nonwhite status, and rural residence statistically decrease health ratings. Male status statistically increases health ratings. Higher education and income in model 2 (Socioeconomic Status) increase health ratings. In model 3, (Psychosocial factors), life stress is associated with reduced self-rating of health, while the amount of social participation is associated with higher self-ratings of health. For model 4, (health behaviors), obesity and being a nondrinker both are associated with decreased self-health ratings. In contrast, being a nonsmoker and increased levels of physical activity or excerise are associated with higher self-assessments of health .

The coefficients in model 5 demonstrate that although most age-adjusted independent factors are significant for the majority of the variables, some lose their significance

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3. It would appear from these results that there exists some form of a threshold level or other barrier at which activity levels provide no additional health status evaluation benefit. However, there is insufficient data within this study to test for such an effect.

Table 6. Self-Rated Health Standardized Beta Coefficients.

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Cum.# Prop. R^2
Demographics						
Age	-.208*	-.187*	-.256*	-.215*	-.185*	
Male	.100*				.090*	
Nonwhite	-.179*				-.090*	
Married	-.006				-.036	
Rural	-.094*				-.052***	
					R^2=10.7	56.6%
Socioeconomic Status						
Occupation		.026			.032	
Education		.249*			.197*	
Income		.117*			.106*	
					R^2=16.9	89.4%
Psychosocial Factors						
Life Stress			-.165*		-.057**	
Social Index			.084*		.039	
					R^2=17.5	92.6%
Health Behaviors						
Obesity				-.064**	-.027	
NonSmoker				.083*	.054**	
NonDrinker				-.059**	.014	
Exercise Level				.097*	.109*	
					R^2=18.9	100%
Constant	2.749*	1.877*	2.833*	2.645*	1.737*	
R^2	10.7	14.6	8.7	7.5	18.9	
Adj. R^2	10.5	14.5	8.5	7.3	18.4	
F-Value	53.1*	94.6*	69.8*	35.8*	36.6*	

Cum. Prop R^2 = Cumulative Total R^2 proportion variance explained by dimension.

*** p < .000; ** p < .01; *** p < .05**

in the overall model (Model 5). Utilizing the highest levels of statistical significance, within this model the static social structure variables of age and nonwhite status decrease health ratings, while male status increases health ratings. Higher education, income and higher levels of exercise also increase health rating. Further, if all the other variables are held constant, the male and nonwhite status coefficients equate to higher health ratings for white males, decreased health ratings for nonwhite females, and no change for white females and nonwhite males health ratings. Even so, the remaining positive predictors cannot outweigh the substantial influence of age.

In terms of explained variance for the predictor dimensions, the highest R^2's are derived from the socioeconomic status and demographic dimensions, each explaining, respectively, 10.7 and 14.6 percent of the variance. These two dimensions represent a proportionate 89.4 percent of the total R^2 of 18.9. Although, the psychosocial factors and health behavior dimensions are able to produce 8.7 and 7.5 percent of the explained variance when analyzed within age-adjusted independent regressions, they produce proportionately only 10.6 percent of the total variance explained.

Research Question #2A. What is the contribution of demographic factors, socioeconomic status, psychosocial factors and health behaviors to personal/role functioning, mental health, symptoms, and general health perceptions?

2B. To what extent are the predictors similar across these four health dimensions?

Results of these two analyses test, first, which variables utilized in question #1 predict the four health dimensions: personal/role functioning, mental health, symptoms, and general health perceptions; and ,second, whether findings in these analyses are similar across the four health dimensions.

Table 7 shows the Pearson product-moment correlations between the four health dimensions and the independent predictor variables described in Table 1. The correlations in this table indicate that most of the associations between the independent predictors and the health dimensions are relatively weak. However, the variables representing male status, education, and increasing exercise levels show the strongest assocations. In addition, the moderate positive correlation between the social and mental health index (MHI) confirms that social network/participation is related to mental health.

Evidence from Table 7 further indicates that there are certain similarities and differences between the health dimensions with the independent predictors. However, hierarchical multiple regression is more appropriately utilized to better assess the independent influence of each of these factors on a particular health dimension. Tables 8-11 show the standardized beta coefficients for each of the health dimensions. For each table, comparisons are made

Table 7. Health Dimension Correlations with Predictor Variables.

	Age	Male	Nonwhite	Married	Rural
Demographics:					
PRF	-.22**	.17**	-.10**	.05	-.06*
MHI	.09**	.17**	-.03	.14**	-.01
SYM	-.01	-.14**	.07*	-.06*	.06*
GHP	-.11**	.06*	-.16**	-.01	-.08**

	Occupation	Education	Income
Socioeconomic Status:			
PRF	.07*	.14**	.04
MHI	.05	.08**	.10**
SYM	-.09**	-.12**	-.10**
GHP	.09**	.18**	.07**

	Life Stress	Social Index
Psychosocial Factors:		
PRF	-.07**	.03
MHI	-.07**	.28**
SYM	.13**	-.09**
GHP	-.10**	.12**

	Obesity	Nonsmoker	Nondrinker	Exercise
Health Behaviors:				
PRF	-.06*	-.01	-.09**	.16**
MHI	.07**	.05	.06*	.11**
SYM	.02	-.07*	.03	-.07**
GHP	-.05	.06*	-.00	.14**

2-tailed Significance: * - .01 ** - .001

PRF = Personal/Role Functioning MHI = Mental Health Index
GHP = General Health Perceptions SYM = Acute Symptoms

between the initial hierarchical models (1-4) and the final model (5) for each dependent health dimension.

After presenting results for the hierarchical and overall models, analysis will be presented which indicates

the proportion of the total variance explained by each independent dimension (Cum. Prop. R^2 in each table). While the cumulative proportionate R^2 is presented for each table based on the hierarchical regression conducted in model 5, the proportion of the total variance accounted for by each independent dimension will be presented in the text, and may also be found in Table 12 (p.61).

In Table 8, models 1 through 4 show that male status, higher education, increased income, a higher social index, and higher levels of activity or exercise are positive predictors of personal/role functioning. A higher age, nonwhite status, increased life stressors, and being a nondrinker are indicators of decreased levels of personal/role functioning.

In model 5 of table 8, several of the variables lose their statistical significance once other variables are entered into the model. In particular, nonwhite status, income, social network index and nondrinking status, become non-significant after adjusting for the other variables in the model. This leaves only three highly significant predictors of personal/role functioning and two lessor predictors.

In models 1-4, the highest variance explained was produced by the demographic (8.3%) and health behavior (7.4%) dimension variables. However in the overall model (model 5), demographics represented approximately 75 percent of the total variance explained. Health behaviors further

represented a proportionate 13.6% of the variance accounted for.

Table 9 presents results for the Mental Health Index. In models 1-4, male status, being married, higher education and incomes, an increased social index, obesity and higher levels of physical activity are all significantly associated with higher health ratings. Increased life stress scores and being a nondrinker are significantly associated with lower health ratings.

Within model 5, although some variables decrease their level of statistical significance, only income becomes nonsignificant in the final model. The psychosocial factors of life stress and social index represent the greatest proportion (50.7%) of variance explained in the overall model4. Demographics produced a proportionate 32.2% of the explained variance.

The regression analysis of acute symptoms presents the lowest explained variance of the three health dimension models (Table 10). In models 1-4, nonwhite status, higher life stress scores, obesity, and being a nondrinker are significantly associated with increased reports of acute symptoms. Male status, rural residence, higher education, increased income, higher social index scores, and increased physical activity levels are significantly associated with

4. It is with some interest that both obesity and exercise level are both statistically positively related to better mental health. This may potentially be due to statistical artefact or to cultural differences in perceptions of obesity on better mental health.

Table 8. Personal/Role Functioning Standardized Coefficients

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Prop. R^2
Demographics						
Age	-.207*	-.212*	-.234*	-.201*	-.203*	
Male	.160*				.138*	
Nonwhite	-.080*				-.031	
Married	.009				-.001	
Rural	-.027				-.012	
					R^2= 8.3	75.5
Socioeconomic Status						
Occupation		-.009			.001	
Education		.080**			.057***	
Income		.069**			.043	
					R^2= 8.9	5.4%
Psychosocial Factors						
Life Stress			-.102*		-.064**	
Social Index			.049***		.037	
					R^2= 9.5	5.4%
Health Behaviors						
Obesity				-.040	-.032	
NonSmoker				.019	.014	
NonDrinker				-.062**	-.015	
Exercise Level				.140*	.120*	
					R^2= 11.0	13.6%
Constant	5.143*	4.852*	5.146*	5.146*	4.517*	
R^2	8.3	6.0	6.0	7.4	11.0	
Adj. R^2	8.1	5.8	5.9	7.2	10.4	
F-Value	39.9*	35.2*	47.2*	35.3*	19.4*	

Prop. R^2 = Proportion of Total R^2 variance explained by independent dimension variables.

*** p < .000; ** p < .01; *** p < .05**

Table 9. Mental Health Index Standardized Coefficients

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Prop. R^2
Demographics						
Age	.106*	.107*	.069*	.093*	.092*	
Male	.146*				.166*	
Nonwhite	-.013				.014	
Married	.106*				.100*	
Rural	-.031				-.016	
					R^2= 4.9	32.2%
Socioeconomic Status						
Occupation		-.007			.004	
Education		.100*			.084**	
Income		.069**			.010	
					R^2= 6.1	7.9%
Psychosocial Factors						
Life Stress			-.073*		-.064**	
Social Index			.276*		.258*	
					R^2=13.8	50.6%
Health Behaviors						
Obesity				.064**	.061**	
NonSmoker				.040	.011	
NonDrinker				-.047***	.078*	
Exercise Level				.127*	.074*	
					R^2=15.2	9.2%
Constant	66.70*	64.04*	63.20*	63.92*	46.73*	
R^2	4.9	2.5	8.8	3.3	15.2	
Adj. R^2	4.7	2.3	8.7	3.0	14.6	
F-Value	22.7*	13.9*	71.4*	14.8*	28.1*	

Prop. R^2 = Proportion of Total R^2 variance explained by independent dimension variables.

*** p < .000; ** p < .01; *** p < .05**

Table 10. Acute Symptoms Standardized Beta Coefficients

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Prop. R^2
Demographics						
Age	-.029	-.028	-.009	-.021	-.025	
Male	-.134*				-.136*	
Nonwhite	.052***				-.002	
Married	-.037				-.029	
Rural	-.068**				.046***	
					R^2= 3.0	45.5%
Socioeconomic Status						
Occupation		-.020			-.026	
Education		-.105*			-.068**	
Income		-.071**			-.035	
					R^2= 4.3	19.7%
Psychosocial Factors						
Life Stress			.130*		.096*	
Social Index			-.093*		-.075*	
					R^2= 5.8	22.7%
Health Behaviors						
Obesity				.017**	.007*	
NonSmoker				-.085	-.071**	
NonDrinker				.042***	-.006	
Exercise Level				-.077*	-.060*	
					R^2= 6.6	12.1%
Constant	3.213*	4.314*	2.716*	3.271*	5.237*	
R^2	3.0	2.2	2.5	1.3	6.6	
Adj. R^2	2.7	2.0	2.3	1.1	6.0	
F-Value	13.4*	12.2*	18.6*	5.9*	11.1*	

Prop. R^2 = Proportion of Total R^2 variance explained by independent dimension variables.

*** p < .000; ** p < .01; *** p < .05**

Table 11. General Health Perception Index Standardized Coefficients

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Prop. R^2
Demographics						
Age	-.094*	-.082*	-.131*	-.098*	-.092*	
Male	.061**				.057**	
Nonwhite	-.149*				-.104*	
Married	-.032				-.054***	
Rural	-.056**				-.041	
					R^2= 4.2	44.2%
Socioeconomic Status						
Occupation		-.008			.005	
Education		.151*			.091*	
Income		.063**			.063**	
					R^2= 5.8	16.8%
Psychosocial Factors						
Life Stress			-.122*		-.052***	
Social Index			.130*		.095*	
					R^2= 7.4	16.8%
Health Behaviors						
Obesity				-.036	.015	
NonSmoker				.067*	.048***	
NonDrinker				-.002	.049***	
Exercise Level				.140*	.135*	
					R^2= 9.5	22.1%
Constant	77.28*	65.08*	74.92*	69.48*	58.11*	
R^2	4.2	4.0	4.2	3.6	9.5	
Adj. R^2	4.0	3.8	4.1	3.4	8.9	
F-Value	19.5*	22.8*	32.5*	16.6*	16.4*	

Prop. R^2 = Proportion of Total R^2 variance explained by independent dimension variables.

*** p < .000; ** p < .01; *** p < .05**

decreased reports of acute symptoms.

Again, some variables (nonwhite status, income, and nondrinker status) lose their statistical significance after adjustment for other factors. In the overall model (model 5), rural residence and increased life stressors are predictive of higher reports of symptoms. Male status, higher education and nonsmoker status remain as predictors of decreased number of symptoms reported. Of note is that age is not a significant predictor of the number of acute symptoms reported, after controlling for other variables in each regression model. This may be due to the infrequency of symptoms reported in this middle-aged sample.

The demographic variables are again the strongest set of predictors, with their 3% R^2, representing a proportionate 45.5% of the total variance accounted for. Socioeconomic status accounts for an additional 19.7% proportionately, and Psychosocial factors for 22.7% of the total accounted variance.

Results for the General Health Perceptions index are shown in Table 11. Increased age, nonwhite status, rural residence and increased life stressors are significant predictors of decreased General Health Perception scores. Male status, higher education, increased income, a higher social index, being a nonsmoker, and higher exercise levels are predictors of increased general health perception scores.

In terms of variance explained, the results differ somewhat from those found for the other health dimensions. The two strongest associations are those of demographics and psychosocial factors (each with R^2=4.2). However, socio-economic status (R^2=4.0) and Health Behaviors (R^2=3.6), are relatively close behind.

Similar to that found with the health dimensions and self-ratings of health, many of the variables found to be statistically predictive in the independent models, (models 1-4) lost their significance in the overall model (model 5). In essence, the robust predictors found were age, male status, non-white status, education, life stress, and exercise level.

In comparing the health dimensions, general health perceptions, and self-ratings of health on the basis of the proportional distribution of variance accounted for, it is the demographic variables which have the greatest predictive value for most of the dependent variables within the separate regression models, with the exception of mental health in which the psychosocial factors dimension is the primary one. The dimension with the second largest variance accounted for varies greatly between the different dependent measures. For the three health dimensions the second place dimensions are: psychosocial factors for acute symptoms; demographics for mental health, and health behaviors for personal/role functioning. The health behaviors dimension also accounts for the second largest amount of variance for

Table 12. Proportion of Total Variance Explained By Health Dimensions, General Health Perceptions and Self-Rated Health.

Dimension	PRF	MHI	SYM	GHP	SRH
Demographics	75.5%	32.2%	45.5%	44.2%	56.6%
Socioecnomic Status	5.4%	7.9%	19.7%	16.9%	32.8%
Psychosocial Factors	5.5%	50.7%	22.7%	16.8%	3.2%
Health Behaviors	13.6%	9.2%	12.1%	22.1%	7.4%
Total R^2	**11.0**	**15.2**	**6.6**	**9.5**	**18.9**

general health perceptions. Socioeconomic status adds a substantial proportion to the variance accounted for in self-ratings of health.

While it is recognized that much of the psychosocial factor and health behavior variance may be driven by the demographic and socioeconomic variables, these results still do not preclude the important relevance social identities play within the formulation of the health dimensions.

Research Question #3A. Are general health perceptions and self-rated health equivalent, or do general health perceptions provide additional information in explaining the variance self-rated health? 3B. What comparative contribution do the identified independent predictors, the three health dimensions, and general health perceptions make to self-rated health?

Having formed the foundational legs of this study in the first two questions, the next phase will be to explore the relationship of the three health dimensions to self-rated health, controlling for the significant predictors.

The first step was to test whether General Health Perceptions (GHP) and Self-Ratings of Health (SRH) measures are equivalent. To reiterate, General Health Perception index items relate to past, current, and future health, as well as health worries/concerns, illness resistance, and pain perceptions. Therefore, it would seem that information included within the index would add to the process of the formulation of health assessments.

Results are shown in Figures 4 and 5. GHP and SRH are the dependent variables, with acute symptoms (SYM), mental health (MHI), and personal/role functioning (PRF) as the primary predictor variables, all controlled for Independent Predictors (IP). The independent predictors are variables identified as significant predictors in the overall models (i.e. #5) in Tables 6 and 8-11. The independent predictors are age, male status, education, social index score, life stress and exercise or activity level. Path values are presented as R^2's. Values in parentheses represent the amount of variance explained by the other two controlling health dimensions. For example, with GHP as the dependent variable, and with MHI and SYM entered in the second step with an R^2 change of 25.4; when PRF is entered into the regression in the third stage, the resulting R2 path is 3.9.

Results are shown in Figure 4. Within this figure, the health dimensions PRF, MHI and SYM explain a greater percent of the variance for GHP than for SRH. In combination, the three health dimensions account for 29.3% of the variance explained for GHP, and only 10.5% for SRH. However, for SRH, the demographic variables included in IP represent over half of the variance accounted for, as compared to only about one-fifth for GHP. This means that GHP is more influenced by the other health dimensions, while SRH is more influenced by the independent predictors. In addition, GHP is more associated to the psychological health dimension, while PRF and SYM are the more highly associated with SRH.

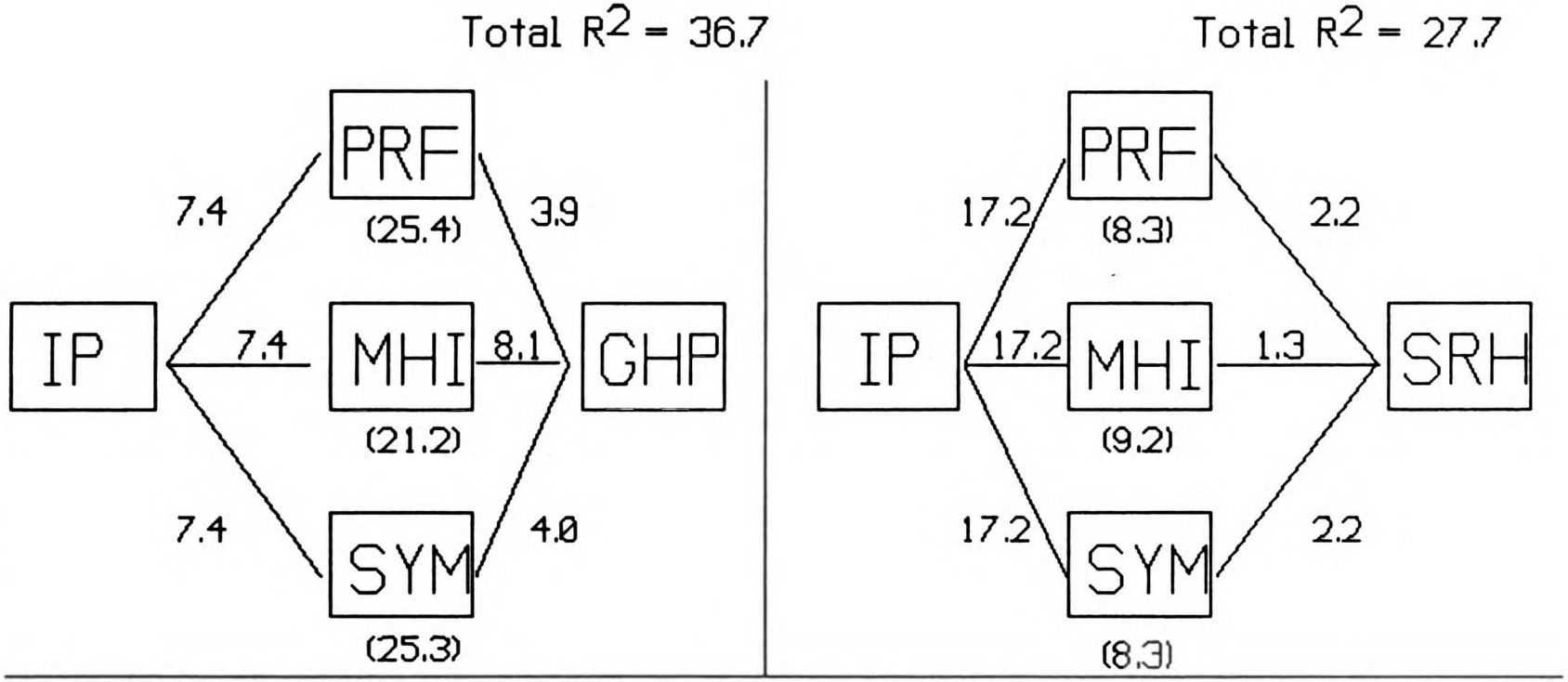
Based on the fact that the amount of variance explained by the two models in Figure 4 differ, and the inverse relationships between the independent predictors and health dimensions to the two dependent variables, the next step is to test whether GHP adds anything to the independent predictors and health dimensions in explaining self-rated health. This procedure was performed by repeating the SRH analysis in Figure 4, and entering general health perceptions into the model as a last step, as shown in the last column of Table 13.

Figure 5 shows the results of this analysis. After adjusting for independent predictors and health dimensions, general health perception explains an additional 13.0% of the variance, beyond that found within the inital SRH model of Figure 4.

Table 13. R^2 Path Coefficient Regression Analyses.

	GHP			SRH			
	Third Stage R^2 Value			Third Stage R^2 Value			
Variable	PRF	MHI	SYM	PRF	MHI	SYM	GHP**
Independent Predictors							
Age, Male, Nonwhite, Education, Life Stress, Activity/Exercise Level (First Stage)	7.4	7.4	7.4	17.2	17.2	17.2	17.2
Health Dimensions							
Controlled Health Dimensions* (Second Stage)	25.4	21.2	25.3	8.3	9.2	8.3	10.5
Personal/Role Functioning	3.9			2.2			
Mental Health		8.1			1.3		
Acute Symptoms			4.0			2.2	
General Health Perceptions							13.0
Total R^2	36.7	36.7	36.7	27.7	27.7	27.7	40.5

* Controlled Health Dimensions indicates inclusion of those health dimensions into the second stage of the equation before the health dimension of interest. In the case of GHP, all three health dimensions are entered together before entering GHP.
** The GHP equation fits the alternative model found in Figure 5.



IP = Independent Predictors

PRF = Personal/Role Functioning

MHI = Mental Health Index

SYM = Acute Symptoms Reported

GHP = General Health Perceptions

SRH = Self-Rated Health

Figure 4. Comparison of Path Models for General Health Perceptions and Self-Rated Health.

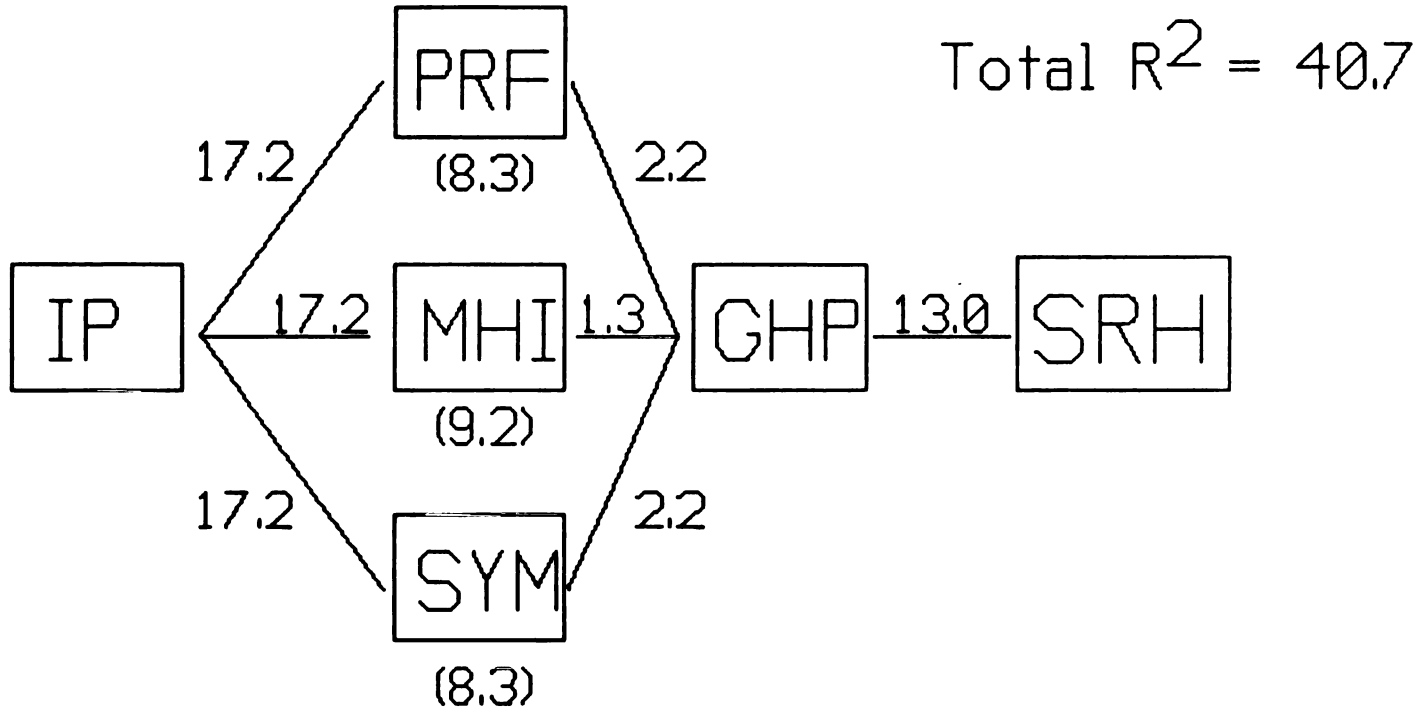


Figure 5. Final Path Model of Associations Between Independent Predictors, Health Dimensions, Health Perceptions and Self-Rated Health.

Of the 40.5% of the total variance explained, 42.3 percent is proportionately explained by the Independent Predictors, 25.8 percent is proportionately explained by the three health dimensions, and 31.9 percent is proportionately explained by health perceptions.

Examination of the three health dimensions and general health perceptions relative contribution to the total variance explained for self-ratings of health (SRH) indicates that they each add a roughly equivalent amount to the explanatory ability of the model. Yet, they each add a lower percentage of explained variance to the model than do the independent predictors.

These findings certainly represent that each of these domains is an important component in the formulation of global self-ratings of health. Within the independent predictors, these findings indicate that health assessments are associated, along with age and male status, with decreased life events, increased participation in social networks, and positive health behaviors (i.e. exercise). The implications of these and other findings will be discussed in the next chapter.

CHAPTER 4

Discussion, Implication, and Conclusions: Social Structure, and Health Dimensions in Self-Assessments of Health

General Discussion

This study was an examination of the predictors of self-ratings of health, and the relative contributions made by the various factors identified as associated with the process of personal health assessments. This analysis arose out of research indicating that self-assessments of health are significant predictors of mortality even after adjusting for sociodemographic variables, clinical disease indicators, and health behaviors.

Although self-ratings of health were found to be significant predictors of mortality, few empirical studies had been performed on what factors are involved in the formulation of health assessments by individuals. Moreover, both those studies looking at self-ratings of health as a predictor of mortality, and the few looking at predictors of self-rated health assessments, tended to focus on older populations who are more likely to have altered their perspective on health assessments, but also have different factors which influence their lives than a "normal" working population (Idler and Kasl, 1991). As such, it should be noted that sample used within this study differs from that of that used for many of the studies linking self-rated health and mortality. In addition, this study included a much smaller proportion reporting their health as fair or poor, than did the mortality studies.

The analysis conducted in this study utilizing the model presented in Figure 1 found that three primary factors

were involved in the formulation of an individual's self-assessment of health. These factors are social structural factors, health dimensions, and general health perceptions.

Evidence presented in Figure 4 indicates that within the confines of this narrow population, health assessment measurement differs depending on the measure utilized. In particular, utilization of an indepth index similar to the general health perceptions index was more highly associated with health dimension factors than variables which represent the individual's social environment. In contrast, a single global self-rating of health is more reflective of items associated with the person's social identity and their environment than issues related to what the health dimensions measure.

Within the broad global measure and the single item measure, there are individual factors which tended to drive both the independent predictors and the health dimensions. For the independent predictors, age and male status were significantly associated with increased ratings of health. Yet, of more interest is the fact that, not only were education, life stress and exercise significantly associated with self-ratings of health, but that they were also consistently associated with each of the three health dimensions, and with general health perceptions.

Further, although only 9.5 percent of the variance of general health perceptions was explained utilizing all the variables included in the demographic, socioeconomic status,

psychosocial factors, and health behavior dimensions, an additional 27.2 percent of the variance was accounted for with the addition of the three health dimensions, within the restricted path analysis model. This is comparable to the Medical Outcomes Study (MOS) results which utilized a similar general health perceptions instrument, and was able to explain 29 percent of the variance. The findings from the MOS were achieved even after adjusting for a number of sociodemographic characteristics and comorbid chronic conditions, not included within this study (Stewart, et al, 1989).

In a manner similar to that found for general health perceptions, the 18.9 percent of self-rated health variance explained in the original hierarchical regression equation was increased to 27.7 by the inclusion of the three health dimensions. The self-rated health variance explained was increased to 40.7 with the inclusion of general health perceptions.

Within a population of employed adults, health is composed of social structural, psychosocial, and health perceptions. The interaction of each of these components is evident by the hierarchical regression analyses. Within the submodels, each age-adjusted predictor dimension was capable of producing significant correlations. However, within the overall model, some of these variables lost their ability to be significant predictors of the dependent health variable.

In this study, some subpopulations (i.e. younger, male) were able to assess their health at higher levels than other subgroups. Certain resources (i.e. education,) were also found to increase the ability of people to assess their health more favorably. Moreover, decreased life stress and increased participation in a social network increased self-ratings of health. Thereby, it would be plausible that a combination of a favorable social identity and access to adequate resources may be positively associated with the ability to partake in healthier behaviors (e.g. exercise and social participation), and decrease the influence of certain psychosocial influences (i.e. life stress).

For each of the three health dimensions, general health perceptions, and self-rated health certain similarities across the dependent variables were found. Age was associated with all except symptoms, while male status was associated with all the dependent variables. For the socioeconomic status variables, education was the most highly associated variable with each of the dependent variables. Income was associated with self-rated health and general health perceptions, but not with any of the three health dimensions. Occupation failed to be significantly related to any of the dependent variables, although this may be due to the simplistic coding utilized.

For the psychosocial factors, life stress was significantly associated with each dependent variable, while social network participation was associated with mental

health, symptoms, and general health perceptions. Lastly, exercise was associated with each dependent variable, along with one or more of the other health behaviors depending on the dependent variable of interest.

Implications

Social identities are a crucial component in the creation of self-assessments of health; not only as direct influences, but also in their indirect affects on health dimensions and health perceptions. Many studies have demonstrated differences in the health states on the basis of sex, race, marital status, religion, and socioeconomic status (Syme, 1992). Yet, few have explored how these factors affect the process of people's health assessments. Previously, there was interest in the concept of the "culture of poverty", and its relevance to the varied facets of a persons life (Flynt, 1988).

This study further indicates the importance of social identities in health assessments regardless whether one is measuring global ratings of health, or utilizing a broader index which measures multiple health perceptions. Moreover, this study indicates additional research is necessary to explore whether these finding hold up when tested within subpopulations identified by this study. In addition, this study indicates that it would be beneficial to attempt to replicate this study within an older population comparable

to those found within the mortality studies cited previously.

Much of health according to this analysis comes out of who we are as defined by ourselves and through our social identities. These findings seem to reaffirm that "health" is what we say it is. When people are asked to evaluate their own health status, they base it on a comparison of what they know; compared to others like them, and compared to what they believe is possible.

Furthermore, this study implies that health is related to the influence of not only life stressors, and the social networks individual's have to mediate stressful life events, but also to the influence of health dimensions which assess or symptoms we perceive, are mental health, and our ability to perform the roles and tasks which we have socially prescribed.

It is important to understand the role of social structures influence on psychosocial health dimensions and health perceptions, as well as on self-assessments of health. Given that the social structure is important in health assessments, social identities also play a large part in the formation of people's psychosocial health, including their ability to access various resources. In addition, within the functionalist approach taken in this study, (i.e. health is ultimately the performance of social roles and tasks), health is primarily a product of the physical and mental capacities which enable individuals to fulfill their

socially-ascribed roles and tasks. Physical, mental, and role functioning patterns of behavior not only contribute to specific modes of disorder and reflect certain disease states, but also influence the individuals ability to fend off diseases. Such patterns have been associated with a persons immunocompetence (Palmblad, 1981). Psychosocial health dimensions are also affected by the induction of psychosocial stressors (a factor associated with lower levels of immunocompetence), and the loss of social networks which might assuage the stresses that are concomitants of the environments found with some social groups.

Therefore when utilizing a self-report measure of health assessment, it is important to appreciate the differences of influence that social structural variables will have on other domains of the measure. The single item measure will include a much greater degree of social structural variance than will a broad index such as the general health perceptions measure.

However, it is also important to understand that psychosocial health dimensions will continue to have their own influence on the formulation of health assessments. It is becoming increasingly clear that psychosocial factors influence health by affecting coping effectiveness, (Gore, 1985). Unfortunately, this area is still largely not understood due to the tremendous task of describing and analyzing the effectiveness of many different coping strategies.

Therefore, the decision as to which health measure is to be utilized should also incorporate aspects of the persons psychosocial health. For this reason the findings in Figure 5 would indicate that utilization of both the broad general health perception measure and the solitary health rating provide a balance of social structural variables and psychosocial influences.

Another reason for inclusion of both measures comes from one of the major propositions in medical sociology where it is stipulated that people's definitions and values concerning health and illness are socially determined, (i.e. they arise from experience of membership in different groups). Thus, while an important implication of health appears to be definition of what is 'normal', the meaning of normality with regard to bodily experience varies immensely between individuals and social groups. Therefore, as different health measures represent different influences on health (i.e. social structural vs. health dimensions), an understanding of 'normal' health within a subpopulation is probably best represented by inclusion of both measures.

One implication of the findings of this study are a need for increased research and interventions which involve social structural factors (e.g. gender or race), attention to psychosocial dimensions which affect people's health (e.g. life stress or personal/role functioning), and how development of adequate resources may significantly impact

people's self-assessments of health (e.g. increased education and social participation).

A second implication of this study is that improvements in an individual's or a population's health will most likely come through direct information from the member(s) as to how they define health. While comparisons of individuals health assessments still need to be made against clinical measures, it would certainly seem plausible from this study that health is more an experienced state than an objective one.

A third implication of this study is that of providing direction for future research toward a better understanding of the variables related to health assessments. Although a multidimensional perspective of health was utilized within this study, there seems to be an important component that has been left out, as indicated by the low level of explained variance by the final model. A certain amount of the remaining variance may be attributed to measurement error and to the other items not included within the study such as access to health care and chronic conditions, as mentioned previously.

Therefore, it would be helpful to replicate this study not only in an older population, but also inclusion of certain other factors not included within this study. Items related to chronic conditions as utilized in the MOS study would be helpful, especially in an older population, as would more objective clinical measures and health utilization measures.

Limitations of the study

As in any study, their are certain limitations which must be explicitly presented for the reader to consider. The first limitation is that of the cross-sectional nature of this investigation. Although the Rand HIE contains longitudinal data, only the baseline interview data were utilized. Future research should explore not only the consistency of self-assessments over time, but also how the factors identified in this model operate within a longitudinal environment.

A second problem with this analysis is the exclusion of certain populations and the potential bias toward a "healthy worker effect". While the findings of this study may be reflective of working adults 25-62 years old, they are not generalizable to other populations such as the aged, the unemployed, to housewives, or to the disabled or chronically ill. Therefore, it is quite possible that health assessments are formulated differently once individuals become a member of one of these segments of society.

In addition, all measures analyzed in the study were obtained through self-report, without the benefit of an independent confirmatory measure. Therefore, it is possible the responses given are biased by a social desirability effect, because the subject wished to appear healthier or sicker than reality. However, the likelihood of this is doubtful for several reasons. First, as this was originally designed to be a study of whether free or copayment premium

affected health care utilization, it is most likely that the original perspective and randomization process removed the probability of this limitation. More important is the fact that a person's health self-assessment is just that, a personal assessment of their health. The person has good reason to express their assessment, and all other information, the way they see them. Moreover, although, clinicians have developed many of their own health assessment measures of how the patient is feeling, no clinician has yet developed a more precise measure than simply asking people in a straight-forward manner, (Lohr, 1989).

A final limitation of this study, (and almost all studies), is the difficulty of historical effects. This study analyzed data from patients interviewed during a period from 1974 to 1977. As such, it must be considered that there have been many changes within the social structural and health care systems, among other influences, which may alter the findings of this study. However, as is evident by the National Health Interview data (See Appendix A), although the percentage of individuals reporting their health as fair or poor has decreased, most of the socio-demographic variables reported show fairly consistent relative patterns. Therefore it is most likely, even with the social forces which have brought about change in the past decade and a half, that the factors identified within

this study would remain stable for the population for which this study is representative.

Directions for Future Research

There is certainly a need for additional research into creating a better understanding of the process of health assessments. Two areas come to mind, in particular. The first is that of comparisons of different social groups and those populations excluded from this study. It would be of great interest to explore the relative importance of the models presented within this study within other populations to search for patterns which may be integrated into the knowledge base of health assessments.

A second area is that of an understanding of different levels of health. As noted previously, this study included only a small percentage which reported their health as poor or fair in comparison to those found in the mortality studies. Therefore, this study became more of a comparison of differences between those reporting their health at optimal levels and suboptimal, than different levels of health. Moreover, this study has focused on predictors of health assessments without exploring differences between levels of health. This would certainly be an area of research interest.

An additional area of research interest would be that of linkage of this study in with other previous research. As noted, many studies have linked sociodemographic

characteristics to both mortality and health status. This study has indicated the additional importance of life stress, social network participation, and exercise to the formulation of health assessments. Additional research would continue within this line of work by adding in other measures noted above such as chronic conditions and factors identified by other studies.

Conclusion

This study indicates the relative importance and association of social structural factors, various health dimensions, and general health perceptions in the formation of self-assessments of health.

Choice of a measure for health assessments is highly dependent upon the degree to which the researcher is willing to accept sociodemographic versus psychosocial factors to be associated with health assessments. Utilizaton of a multi-dimensional measure (i.e. general health perceptions) will incorporate more of a psychosocial influence, while a global health measure is more indicative of social structural influences. The inclusion of both measures provides a more balanced approach to assessment of the individual's health.

While each of the three components has an important role in the health assessment process, additional research is necessary. It is hoped that future research will be able to investigate different models which include variables not included within this analysis. It is also hope they will be

able to describe how different groups' health assessments are affected by different variables, as well as what factors differentiate excellent, good, and poor health.

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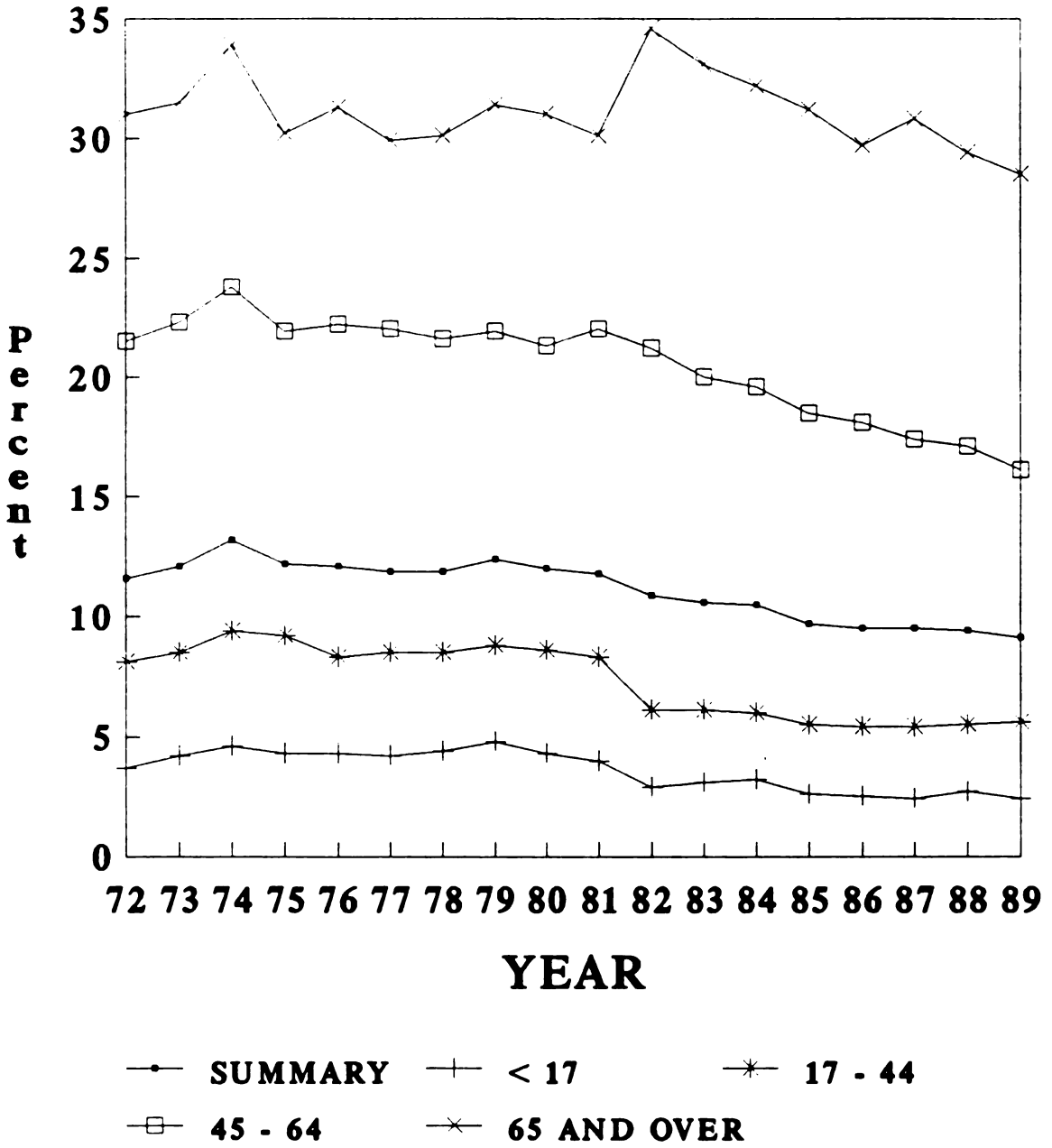
APPENDICES

Appendix A

* Variables with more than two categories include a summary indicator of the variable.

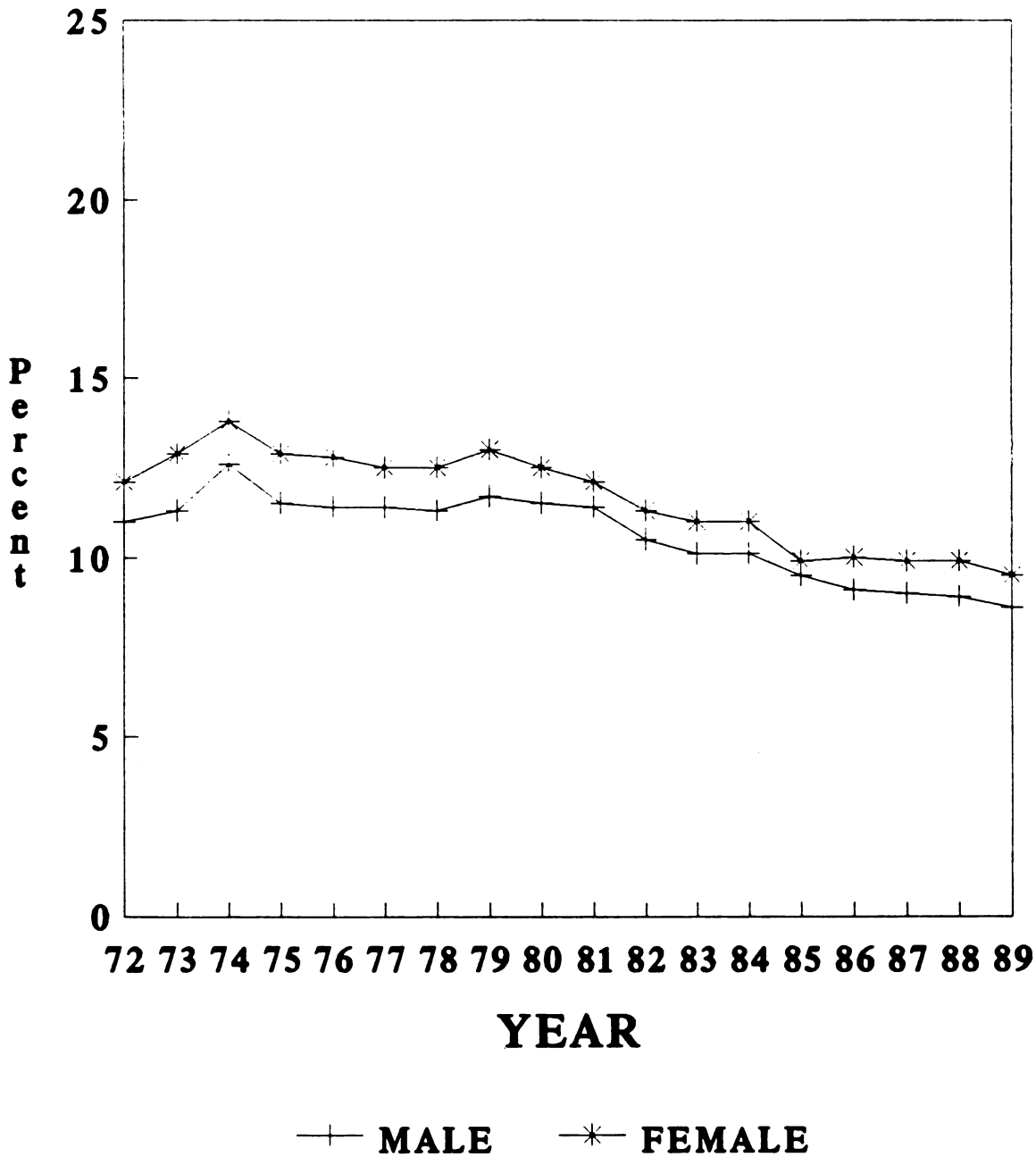
Note: Health categories prior to 1982 were Excellent, Good, Fair, or Poor. In 1982 they were changed to Excellent, Very Good, Good, Fair or Poor.

Percent Reporting Health as Fair or Poor By Age Categories, 1972-1989

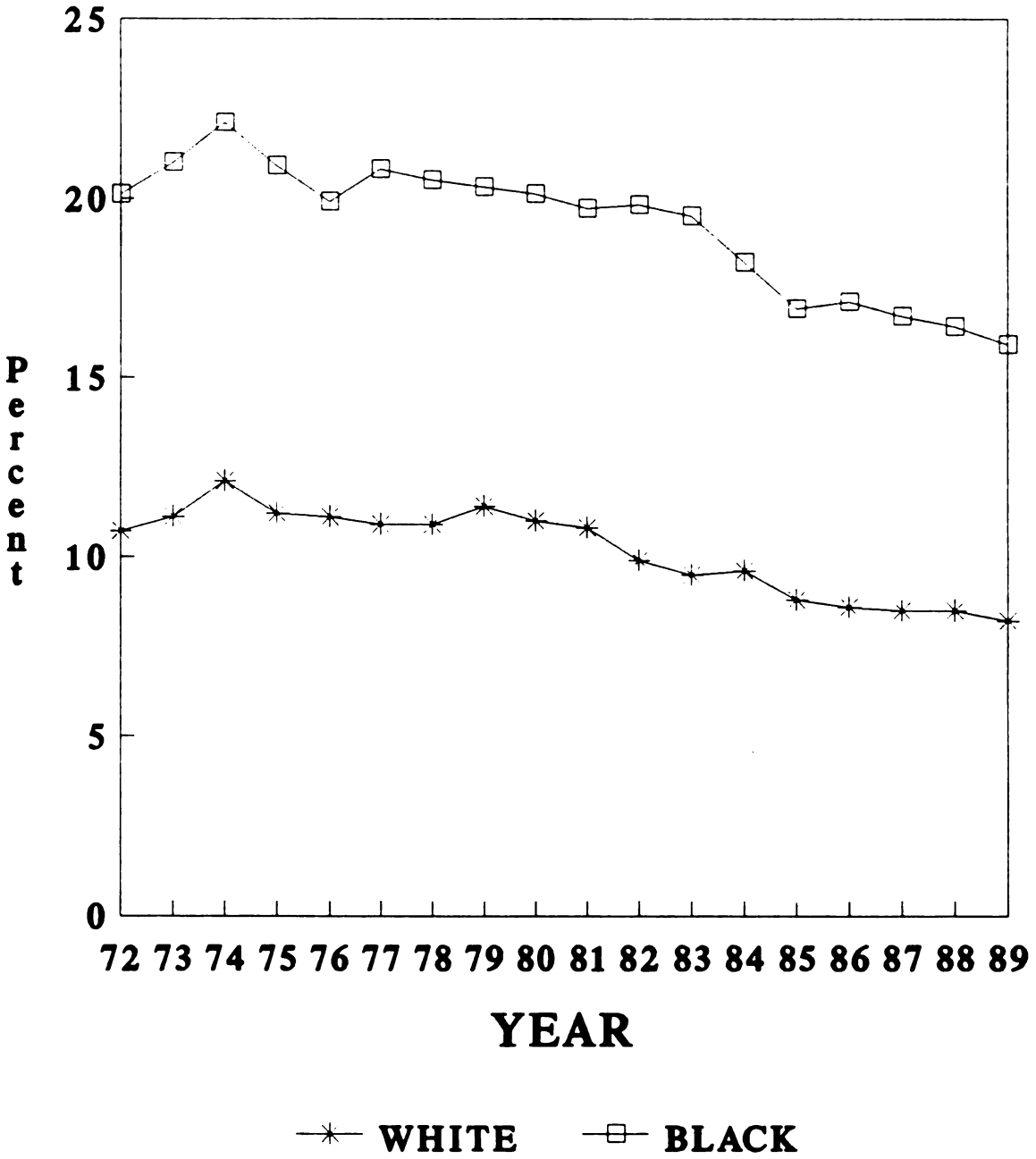


Note: Health Categories Changed in 1982

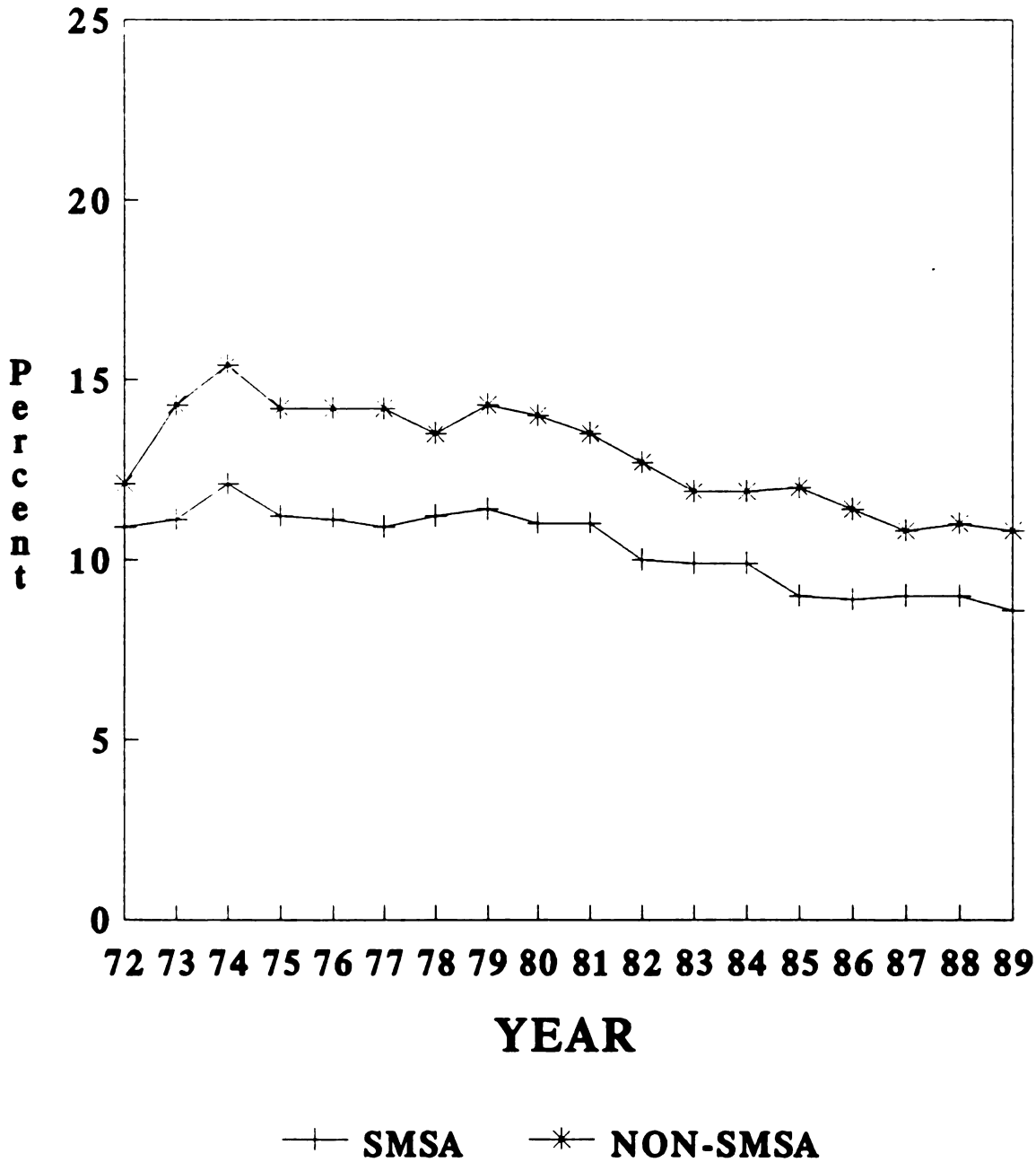
Age-Adjusted Percent Reporting Health as Fair or Poor By Sex, 1972-1989



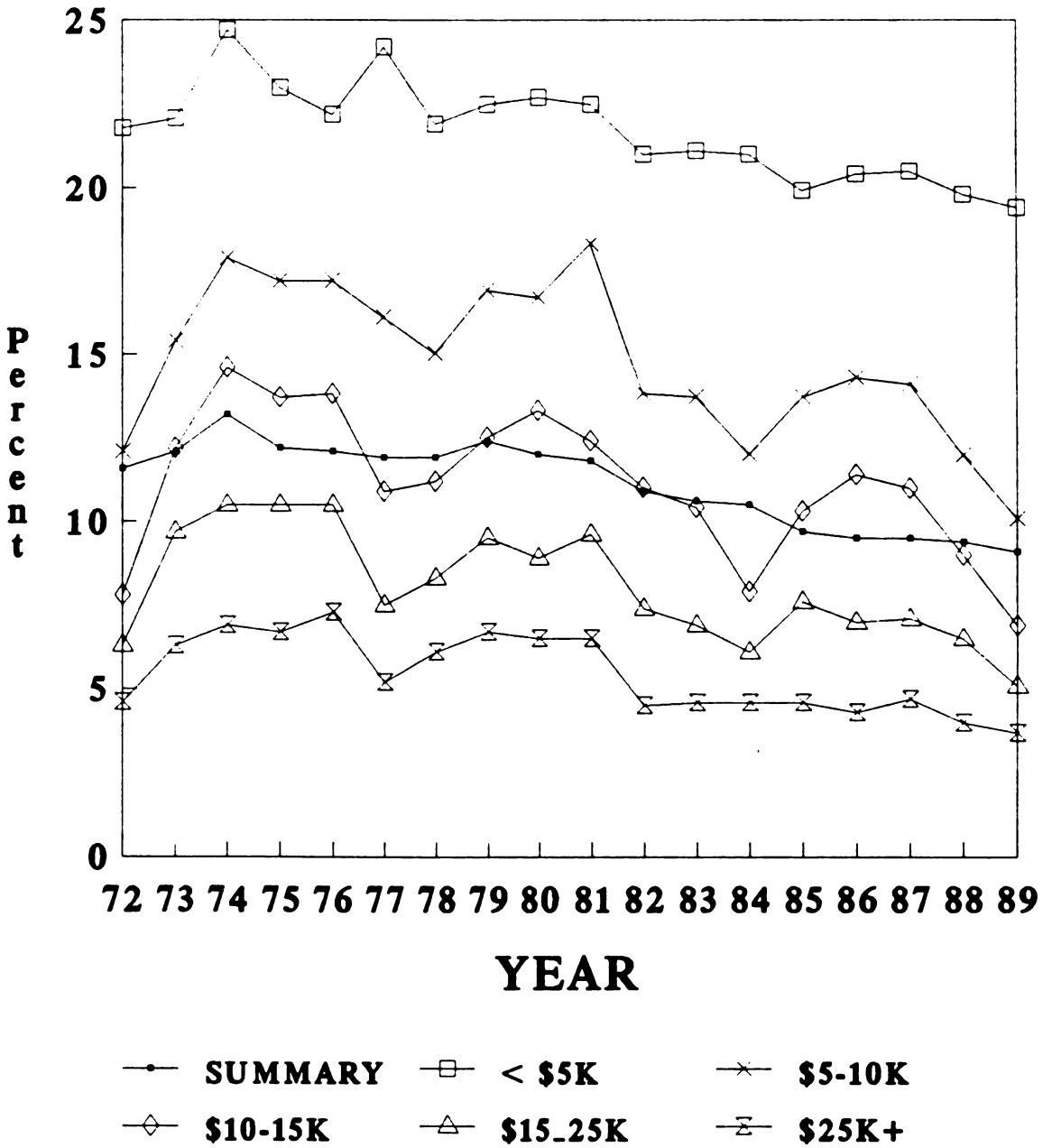
Age-Adjusted Percent Reporting Health as Fair or Poor By Race, 1972-1989



Age-Adjusted Percent Reporting Health as Fair or Poor By Residence, 1972-1989

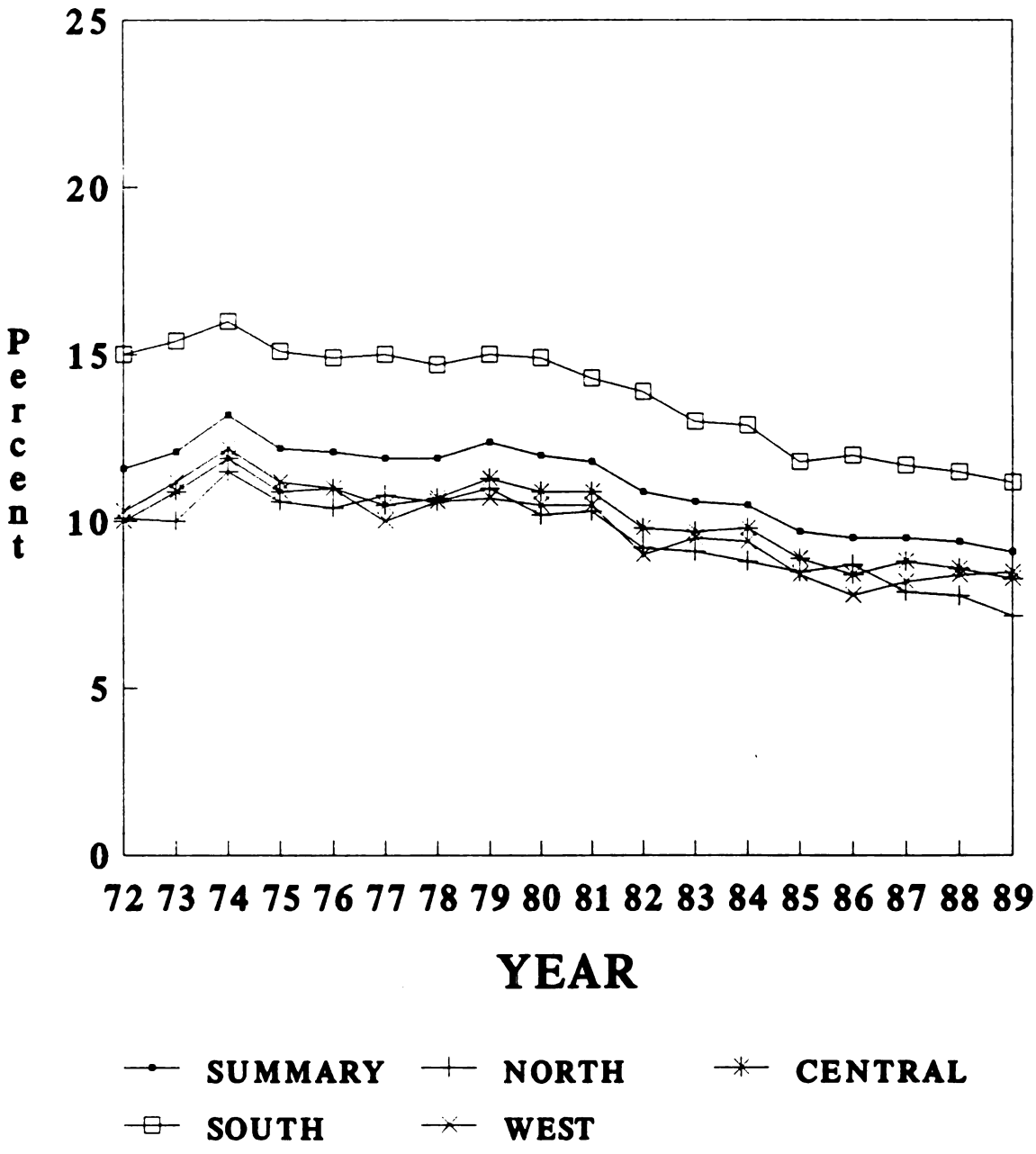


Age-Adjusted Percent Reporting Health as Fair or Poor By Income Level, 1972-1989



Note: In 1972 Constant Dollars

Age-Adjusted Percent Reporting Health as Fair or Poor By U.S. Region, 1972-1989



Appendix B. Index Questionnaires.

Life Stress Index

1. Are you currently married?
   no=0, yes=-1.

2. Have you ever been married?
   no=0, yes=1.

During the past 6 months,...

(if respondent is married, else skip to Question 5).
3. would you say that you and your spouse have been arguing with each other more than usual, or less than usual?
   2=Yes, a lot more;
   1=Yes, a little more;
   0=About the same;
   -1=No, a little less;
   -2=No, a lot less;

4. would you say you have been arguing with you in-laws more than usual or less than usual?
   2=Yes, a lot more;
   1=Yes, a little more;
   0=About the same;
   -1=No, a little less;
   -2=No, a lot less;

(if no, skip to Question 9).
5. have you had any special girlfriend or boyfriend?
   no=0, yes=1.

6. would you say that you and your girlfriend/boyfriend have been arguing with each other more than usual, or less than usual?
   2=Yes, a lot more;
   1=Yes, a little more;
   0=About the same;
   -1=No, a little less;
   -2=No, a lot less;

7. did you split up with your girlfriend/boyfriend?
   no=0;
   yes, got back together=1;
   yes, remain split up=2

8. have you been arguing with your parents more than usual or less than usual?
   2=Yes, a lot more;
   1=Yes, a little more;
   0=About the same;
   -1=No, a little less;
   -2=No, a lot less;

9. have you worked at any job for pay, either full-time or part-time?
 no=0, yes=1.

10. have you been fired, or laid off, from any job?
 no=0, yes=1.

11. has there been any major change in your responsibilities at work?
 2=Yes, a lot more;
 1=Yes, a little more;
 0=About the same;
-1=No, a little less;
-2=No, a lot less;

12. has there been any major change in your responsibilities at home?
 2=Yes, a lot more;
 1=Yes, a little more;
 0=About the same;
-1=No, a little less;
-2=No, a lot less;

13. have there been any major changes in your personal habits - that is, the way you talk, dress, eat, or spend your time?
 no=0; yes, for better=-1, yes, for worse=1.

14. did any close family member die?
 no=0, yes=1.

15. did any close friend of yours die?
 no=0, yes=1.

16. have there been any major changes in your living conditions - like moving to a new place, or the neighborhood getting better or worse, or your house or apartment in better or worse shape?
 2=No, a lot worse;
 1=No, a little worse;
 0=About the same;
-2=Yes, a lot better;
-1=Yes, a little better;

17. were you physically attacked or assaulted in any way by another person - like in a fist fight, or being beaten up or mugged?
 no=0, yes=1.

18. did anyone rob or steal something from you - that is , rob you on the street or take money or property from your home or car?
 no=0, yes=1.

19. were you in any kind of accident which involved property damage, but no personal injuries?
 no=0, yes=1.

20. did you have any legal problems?
 no=0, yes=1.

21. were you attending school as a full-time student?
 no=0, yes=1.

22. did you change to a new school?
 no=0, yes=1.

23. did you have to leave school?
 -1=Yes, because of graduation
 0=No, still in school
 1=Yes, because of problems

24. do you expect to have any problems making payments on any debts or financial obligations you have - like taxes, mortgage payments, consumer loans or installment debt?
 no=0, yes=1.

25. During the past 5 years, how many homes (houses, apartments, trailers, etc.) have you lived in, including the one you live in now?
 1=0; 2-4=1; 5 or more=2.

Social Participation/Network Index

1. About how many families in your neighborhood are you well enough acquainted with that you visit each other in your homes?

   _____ Families

2. About how many close friends or relatives do you have, people you can feel at ease with and can talk with about what is on your mind?

   _____ Close friends

3. Over a year's time, about how often do you get together with friends or relatives, like going out together or visiting in each other's homes?

   A. Every day
   B. Several days a week
   C. About once a week
   D. 2 or 3 times a month
   E. About once a month
   F. 5 to 10 times a year
   G. Less than 5 times a year

4. During the past month, about how often have had friends over to your home?

   A. Every day
   B. Several days a week
   C. About once a week
   D. 2 or 3 times a month
   E. Once in past month
   F. Not at all in past month

5. About how often have you visited with friends at their homes during the past month?

   A. Every day
   B. Several days a week
   C. About once a week
   D. 2 or 3 times a month
   E. Once in past month
   F. Not at all in past month

6. About how often were you on the telephone with close friends or relatives during the past month?

   A. Every day
   B. Several days a week
   C. About once a week
   D. 2 or 3 times
   E. Once
   F. Not at all

7. How hoofed have you attended a religious service during the past month.

   A. Every day
   B. Several days a week
   C. About once a week
   D. 2 or 3 times a month
   E. Once in past month
   F. Not at all in past month

8. About how many volunteer groups or organizations do you belong to, like church groups, clubs or lodges, parent groups, etc.?

   _____ Groups or organizations

9. How active are you in the affairs of these groups or clubs you belong to?

   A. Very active, attend most meetings
   B. Fairly active, attend fairly often
   C. Not active, belong but hardly ever go
   D. Do not belong to any groups or clubs

Personal Role/Functioning Index

1. Can you dress yourself?
   a. Yes b. Yes, but only slowly c. No, I can't do this

2. Can you walk to a table for meals?
   a. Yes b. Yes, but only slowly c. No, I can't do this

3. Can you walk around inside the house?
   a. Yes b. Yes, but only slowly c. No, I can't do this

4. Can you walk a block or more?
   a. Yes b. Yes, but only slowly c. No, I can't do this

5. Can you do light work around the house like dusting or washing dishes?
   a. Yes b. Yes, but only slowly c. No, I can't do this

6. Can you walk uphill or up stairs?
   a. Yes b. Yes, but only slowly c. No, I can't do this

7. If you wanted to, could you run a short distance?
   a. Yes b. Yes, but only slowly c. No, I can't do this

8. Could you do moderate work at home like moving a chair or table, or pushing a vacuum cleaner?
   a. Yes b. Yes, but only slowly c. No, I can't do this

9. If you wanted to, could you participate in active sports such as swimming, tennis, basketball, volleyball, or rowing a boat?
   a. Yes b. Yes, but only slowly c. No, I can't do this

10. Can you do hard activities at home, heavy work like scrubbing floors, or lifting or moving heavy furniture?
    a. Yes b. Yes, but only slowly c. No, I can't do this

11. Can you eat without help?
    a. Yes b. Yes, but only slowly c. No, I can't do this

12. Can you use the bathroom without help?
    a. Yes b. Yes, but only slowly c. No, I can't do this

13. Do you need help eating, dressing, bathing, or using the toilet?

    a. Yes b. No

14. How long have you needed help eating, dressing, bathing, or using the toilet?

    a. less than 1 month b. 1-3 months c. more than 3 months

15. Are you in bed or a chair for most or all of the day because of health?

    a. Yes b. No

16. How long have you been in bed or a choir for most or all of the day because of health?

    a. less than 1 month b. 1-3 months c. more than 3 months

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

    a. Yes b. No

18. How long have you had to stay indoors most or all of the day because of health?

    a. less than 1 month b. 1-3 months c. more than 3 months

19. Does your health limit the kind of vigorous activities you can do?

    a. Yes b. No

20. How long has your health limited the kind of vigorous activities you can do?

    a. less than 1 month b. 1-3 months c. more than 3 months

21. Do you have trouble walking several blocks or climbing a few flights of stairs?

    a. Yes b. No

22. How long have you had trouble walking several blocks or climbing a few flights of stairs?

    a. less than 1 month b. 1-3 months c. more than 3 months

23. Do you have trouble bending, lifting, or stooping because of health?

    a. Yes b. No

24. How long have you had trouble bending, lifting, or stooping because of health?

    a. less than 1 month b. 1-3 months c. more than 3 months

25. Do you have trouble walking one block or climbing one flight of stairs?

a. Yes b. No

26. How long have you had trouble walking one block or climbing one flight of stairs?

a. less than 1 month b. 1-3 months c. more than 3 months

27. Are you able to drive a car?

a. No, because of my health
b. No, for some other reason
c. Yes, able to drive car

28. Because of health how long have you been unable to drive?

a. less than 1 month b. 1-3 months c. more than 3 months

29. Do you need assistance when you travel in the community?

a. Yes b. No

30. How long have you needed assistance in traveling?

a. less than 1 month b. 1-3 months c. more than 3 months

31. Does your health keep you from working at a job, doing work around the house, or going to school?

a. Yes b. No

32. How long has your health kept you from working at a job, doing work around the house, or going to school?

a. less than 1 month b. 1-3 months c. more than 3 months

33. Does your health limit you in any way from doing anything you want to do?

a. Yes b. No

34. How long has your health limited you in any way from doing things you want to do?

a. less than 1 month b. 1-3 months c. more than 3 months

35. Are you unable to do certain kinds or amounts of work, housework, or schoolwork because of your health?

a. Yes b. No

36. How long have you been unable to do certain kinds or amounts of work, housework, or schoolwork because of your health?

a. less than 1 month b. 1-3 months c. more than 3 months

Mental Health Index

1. Have you been bothered by nervousness or "nerves" during the past month?

   A. Extremely so, to the point where I could not take care of things
   B. Very much bothered
   C. Bothered quite a bit by nerves
   D. Bothered some, enough to notice
   E. Bothered just a little by nerves
   F. Not bothered at all by this

2. How happy, satisfied, or pleased have you been with your personal life during the past month?

   A. Extremely happy, could not have been more satisfied or pleased
   B. Very happy most of the time
   C. Generally satisfied, pleased
   D. Sometimes fairly satisfied, sometimes fairly unhappy
   E. Generally dissatisfied, unhappy
   F. Very dissatisfied, unhappy most of the time

3. Have you been in firm control of your behavior, thoughts, emotions, feeling during the past month?

   A. Yes, very definitely
   B. Yes, for the most part
   C. Yes, I guess so
   D. No, not too well
   E. No, and I am somewhat disturbed
   F. No, and I am very disturbed

4. Have you been anxious, worried, or upset during the past month?

   A. Yes, extremely so, to the point of being sick or almost sick
   B. Yes, very much so
   C. Yes, quite a bit
   D. Yes, some, enough to bother me
   E. Yes, a little bit
   F. No, not at all

5. Have you had any reason to wonder if you were losing you mind, or losing control over the way you act, talk, think, feel, or of your memory during the past month?

   A. No, not at all
   B. Maybe a little
   C. Yes, but not enough to be concerned or worried about it
   D. Yes, and I have been a little concerned
   E. Yes, and I am quite concerned
   F. Yes, and I am very much concerned about it

6. Have you felt downhearted and blue during the past month?

   A. All of the time
   B. Most of the time
   C. A good bit of the time
   D. Some of the time
   E. A little of the time
   F. None of the time

7. Has your daily life been full of things that were interesting to you during the past month?

   A. All of the time
   B. Most of the time
   C. A good bit of the time
   D. Some of the time
   E. A little of the time
   F. None of the time

8. Have you been waking up feeling fresh and rested during the past month?

   A. Always, every day
   B. Almost every day
   C. Most days
   D. Some days, but usually not
   E. Hardly ever
   F. Never wake up feeling rested

9. Have you been feeling emotionally stable and sure of yourself during the past month?

   A. All of the time
   B. Most of the time
   C. A good bit of the time
   D. Some of the time
   E. A little of the time
   F. None of the time

10. How much of the time have you felt cheerful, light-hearted during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

11. How much of the time have you felt lonely during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

12. How much of the time, during the past month, have you felt calm and peaceful?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

13. Have you been moody or brooded about things during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

14. Have you felt restless, fidgety, or impatient during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

15. How much of the time have you felt loved and wanted during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

16. How often did you become nervous or jumpy when faced with excitement or unexpected situations during the past month?

    A. Always
    B. Very often
    C. Fairly often
    D. Sometimes
    E. Almost never
    F. Never

17. During the past month, how much of the time have you felt that the future looks hopeful and promising?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

18. How much of the time did you feel relaxed and free of tension during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

19. During the past month, how much of the time have you generally enjoyed the things you do?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

20. Did you feel depressed during the past month?

    A. Yes, to the point that I did not care about anything for days at a time
    B. Yes, very depressed almost every day
    C. Yes, quite depressed several times
    D. Yes, a little depressed now and then
    E. No, never felt depressed at all

21. How much of the time have you been very nervous during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

22. When you got up in the morning, this past month, how often did you expect an interesting day?

    A. Always
    B. Very often
    C. Fairly often
    D. Sometimes
    E. Almost never
    F. Never

23. How much of the time have you felt tense or high strung during the past month?

    A. All of the time
    B. Most of the time
    C. A good bit of the time
    D. Some of the time
    E. A little of the time
    F. None of the time

24. How often did your hands shake when you tried to do something during the past month?

    A. Always
    B. Very often
    C. Fairly often
    D. Sometimes
    E. Almost never
    F. Never

25. How often did you feel that you had nothing to look forward to during the past month?

A. Always
B. Very often
C. Fairly often
D. Sometimes
E. Almost never
F. Never

26. During the past month, how often did you feel that others would be better off if you were dead?

A. Always
B. Very often
C. Fairly often
D. Sometimes
E. Almost never
F. Never

27. How much of the time were you able to relax without difficulty during the past month?

A. All of the time
B. Most of the time
C. A good bit of the time
D. Some of the time
E. A little of the time
F. None of the time

28. During the past month, how much of the time did you feel that your love relationships, loving and being loved, were full and complete?

A. All of the time
B. Most of the time
C. A good bit of the time
D. Some of the time
E. A little of the time
F. None of the time

29. How often, during the past month, did you feel that nothing turned out for you the way you wanted it to?

A. Always
B. Very often
C. Fairly often
D. Sometimes
E. Almost never
F. Never

30. How much of the time has living been a wonderful adventure for you during the past month?

A. All of the time
B. Most of the time
C. A good bit of the time
D. Some of the time
E. A little of the time
F. None of the time

31. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?

A. Always
B. Very often
C. Fairly often
D. Sometimes
E. Almost never
F. Never

32. Did you ever think about taking your own life during the past month?

A. Yes, very often
B. Yes, fairly often
C. Yes, a couple of times
D. Yes, at one time
E. No, never

33. How often did you get rattled, upset, or flustered during the past month?

A. Always
B. Very often
C. Fairly often
D. Sometimes
E. Almost never
F. Never

34. How much of the time were you a happy person during the past month?

A. All of the time
B. Most of the time
C. A good bit of the time
D. Some of the time
E. A little of the time
F. None of the time

35. How often, during the past month, did you find yourself having difficulty trying to calm down?

A. Always
B. Very often
C. Fairly often
D. Sometimes
E. Almost never
F. Never

36. How much of the time have you been in low or very low spirits during the past month?

A. All of the time
B. Most of the time
C. A good bit of the time
D. Some of the time
E. A little of the time
F. None of the time

37. Have you been under, or felt under, any strain, stress, or pressure during the past month?

A. Yes, almost more than I could stand or bear
B. Yes, quite a bit of pressure
C. Yes, some, more than usual
D. Yes, some, but about normal
E. Yes, a little bit
F. No, not at all

Acute Symptoms Index

All responses are coded 0=No, 1=Yes.

Index is constructed by counting up all affirmative answers.

During the past 30 days,

1. ...did you have a cough, without fever, which lasted at least three weeks?
2. ...did you have a weight loss of more than ten pounds, unless you were dieting?
3. ...did you have an upset stomach, for less than twenty-four hours?
4. ...did you have stiffness, pain or swelling joints, lasting more than two weeks?
5. ...did you have backaches or sciatica?
6. ...did you have trouble falling asleep at night?
7. ...did you have a skin rash or breaking out on any part of your body?
8. ...did you have shortness of breath with light exercise or light work?
9. ...did you have chest pain when exercising?
10. ...did you have your nose stopped up, or sneezing or allergies for two weeks or more?
11. ...did you have swollen ankles when you woke up?
12. ...did you have headaches almost every day?
13. ...did you have a cough without fever which lasted for less than a week?
14. ...did you have loss of consciousness, fainting, or passing out?
15. ...did you have acid indigestion or heartburn after many meals?
16. ...did you have a sprained ankle, but you could still walk?
17. ...did you have a toothache?

18. ...did you have a stomach "flu" or virus with vomiting and diarrhea?

19. ...did you have bleeding not caused by accident or injury?

20. ...did you have an eye infection?

21. ...did you have difficulty passing urine, or prostate trouble? (men only)

22. ...did you have difficulty controlling urine, or bladder or kidney problems (women only)

23. ...did you have irregular periods, or bleeding between periods (women only)

General Health Perceptions

1. According to doctors I've seen, my health is now excellent.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

2. I seem to get sick a little easier than other people.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

3. I feel better now than I ever have before.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

4. I will probably be sick a lot in the future.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

5. I never worry about my health.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

6. Most people get sick a little easier than I do.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

7. I am somewhat ill.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

8. In the future, I expect to have better health than other people I know.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

9. I was so sick once I thought I might die.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

10. I'm not as healthy now as I used to be.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

11. I worry about my health more than other people worry about their health.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

12. My body seems to resist illness very well.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

13. I'm as healthy as anybody I know.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

14. I think my health will be worse in the fure than it is now.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

15. I've never had an illness that lasted a long period of time.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

16. My health is excellent.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

17. I expect to have a very healthy life.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

18. I have been feeling bad lately.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

19. I have never been seriously ill.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

20. When there is something going around, I usually catch it.

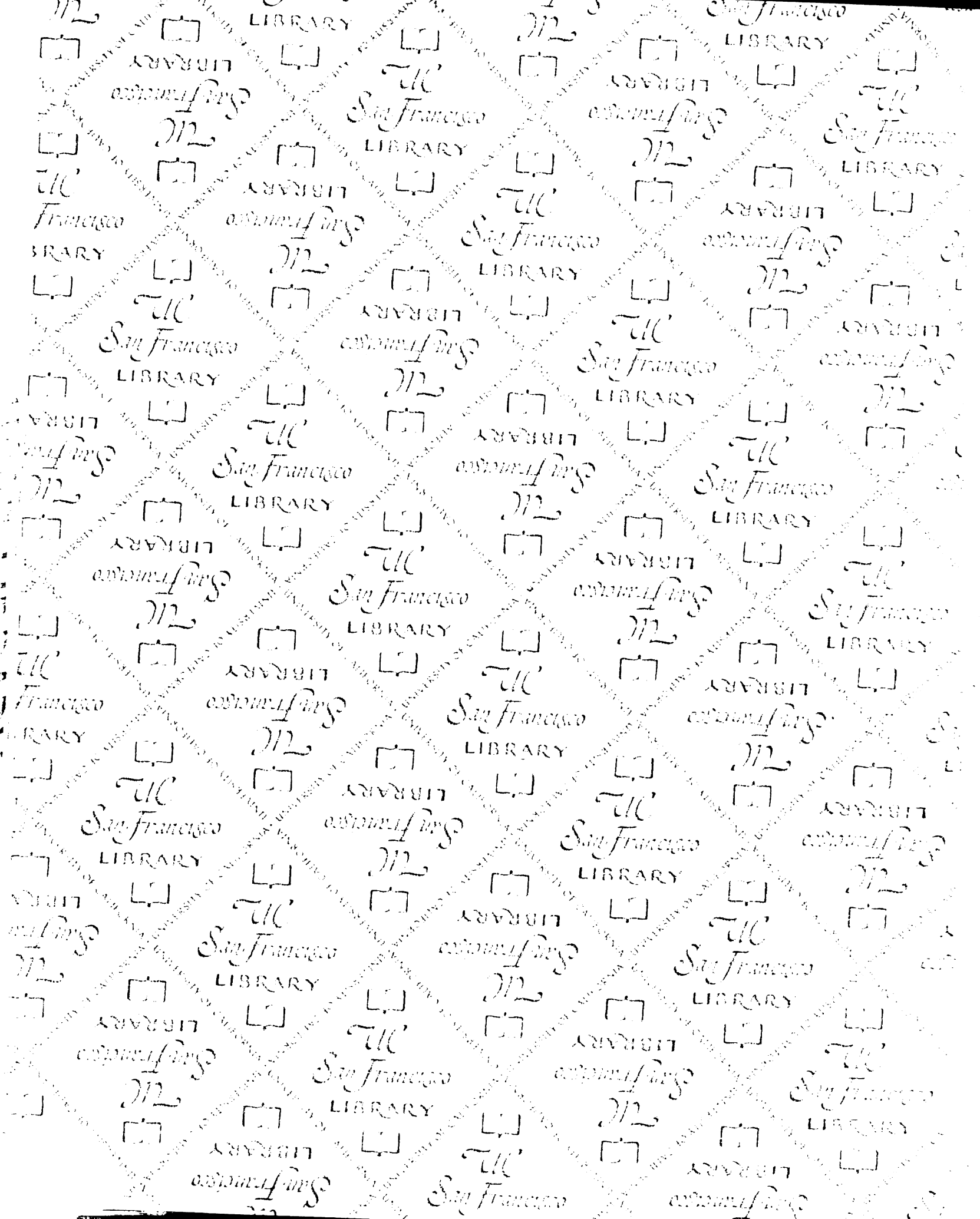
Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

21. Doctor's say that I am now in poor health.

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False

22. I feel about as good now as I ever have..

Definitely True	Mostly True	Don't Know	Mostly False	Definitely False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