STUDIES OF THE VALUE PLACED ON HEALTH

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ABSTRACT

Survey instruments requiring rating and ranking tasks were administered to respondents in five populations (N=2058) to study the value placed on health. Correlations among ratings confirmed groups of items hypothesized to measure values placed on physical, mental, and social health and identified a fourth dimension pertaining to value of health behavior. Studies based on ranking tasks yielded a method for estimating the value of health in relation to other personal values (e.g., accomplishment, exciting life) and identified three very general dimensions of value orientation. Ranks assigned to health and other personal values were less reliable for respondents from general populations than university students. Despite limited measurement precision, noteworthy differences in health values were observed among the five populations and between sociodemographic groups within populations. Health tended to be valued more by women, and by older, less educated, and poorer respondents.

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I. INTRODUCTION

Although the concept of health as a value has often been ignored by value theorists in general, it has received some attention in both theoretical and empirical health-related literature. Health value measures have received less attention, however, than survey measures of health status, attitudes, patient satisfaction, and other concepts of interest to health care researchers. In addition, to an even greater extent than is true for measures of these other concepts, there is a lack of information about the reliability and validity of survey instruments used to measure value placed on health and about the extent and nature of population differences in health values.

Theoretical arguments regarding the role of value placed on health in models of health status and health and illness behavior have been offered by Bull (1941), Goldstein (1959), Kenny (1963), Mechanic (1968), Andersen and Newman (1973), Rosser (1971), Freeman, et al. (1972), and by proponents of the Health Belief Model (e.g., Becker, Haefner, Kasl, et al., 1977). Conceptualizations of health as a value in relation to other values have attributed greatest importance to health (e.g., Bull, 1941; Freeman, et al., 1972), to the extent that one investigator (Rokeach, 1974) concluded that health is too important to measure. His logic was based on the expectation that health would be valued so highly that little or no score variation would be observed. To the contrary, Mechanic (1968) has argued that despite the high placement of health in the hierarchy of ideals, health is likely to be valued less when other essential values (e.g., national security) are seriously

threatened. Theorists have also addressed the consequences of differences in value placed on health. Rosser (1971), Andersen and Newman (1973), and Becker, Drachman, and Kirscht (1974), for example, have argued that health values influence the actions of individuals. The latter group has called attention to the problems of measuring value placed on health in tests of such hypotheses (Becker, et al, 1974).

From Rokeach's (1973) theoretical conceptualization of the role of values, it follows that a personal system of health values derives from the forces that act on the individual (e.g., life stress events and perceptions regarding health status), and serves as a standard for decision-making with regard to health and illness behavior as well as a standard during conflict resolution (Ware and Young, 1976). Specifically, from theory regarding the role of health values as independent variables (i.e., as standards), it follows that to the extent health is valued, standards regarding health care services would be raised. Thus, the value of health would be positively associated with the importance placed on desirable characteristics of health care services. Theory regarding the role of values as independent variables also assumes that values have a strong motivational component and, therefore, serve as a guide in determining individual actions (e.g., when to use health care services). Thus, differences in value placed on health may account, at least in part, for the well-documented difference in use of health care services by men and women (i.e., women may value health more than men). Other hypotheses derive from theory regarding value placed on health as a dependent variable, i.e., that health values reflect the health-related forces

that act on the individual. From this theory, for example, it follows that health would be valued more by those presently sick than by those enjoying positive well-being. Consistent with this hypothesis and the well-documented negative relationship between health status and age, a positive relationship between age and value placed on health should be observed. Whereas empirical tests have yielded some support for health value theory (Andersen, 1968; Fabrega and Roberts, 1972; Wallston et al., 1974; Ware and Young, 1976), it appears that the usefulness of value placed on health as a concept in applied (as opposed to basic) research and the validity of health value rating and ranking measures are at best poorly understood (Ware and Young, 1976).

Included among the many methods that have been used to obtain estimates of personal values are rating and ranking tasks suitable for use in general population surveys. Rating tasks have the advantages of allowing respondents to rate each value construct on a value continuum without regard to other values and using instructions that can be understood by the great majority of respondents in general population surveys. Ratings are associated with the disadvantage of allowing assignment of the same importance to all values, which may lead to little or no score variability. Ranking batteries have the advantage of forcing respondents to make finer value discriminations and thereby yielding greater apparent score variability. Ranking tasks are associated with the disadvantages of more complex instructions and ipsative scores, i.e., lack of independence between scores within individuals.

This paper focuses on some issues involved in the conceptualization and measurement of health as a value using survey instruments

that employ rating and ranking methods. Specifically, the following questions are addressed: How important is health as a value? Is there enough variability in value placed on health to warrant inclusion of health in value surveys? Do populations differ in the value placed on health? What is the dimensionality of health values (i.e., is it possible to distinguish values placed on physical, mental, and social health components)? What are some of the methodological issues involved in measuring value placed on health (e.g., how reliable are health value scores)?

II. METHODS

The methods of the research are described in detail elsewhere (Ware and Young, 1976; Ware, Young, and Wright, 1974). A summary of methods pertaining to the issues addressed in this paper is presented below.

Data Gathering and Population Characteristics

Data were gathered both with and without interviewer supervision using a standardized self-administered survey instrument containing: (a) 22 items describing individual characteristics relevant to health; and (b) an 18-item modification of Rokeach's (1973) Value Survey. The batteries differed with regard to both content and nature of the task required of respondents.

The 22-item battery contained specific descriptions of personal characteristics indicative of physical, mental, and social health status as well as ability to prevent illness. Respondents were required to independently rate the value (importance) placed on each characteristic as a guiding principle in life.[1] A five-point scale ranging from "The Most Important to "Least Important" was printed below each item to facilitate the rating task. Scores ranging from one to five were assigned to response choices to obtain an ordinal

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[1] Instructions to respondents prior to the rating task were as follows: "On the next two pages are some more values. This time we would like you to judge how important each one is to you as a guiding principle in YOUR life. There are no right or wrong answers. We simply want to know how important each value is to you." These instructions were followed by a detailed example of how to record ratings on the questionnaire.

estimate of the absolute value placed on the component of health status or behavior described by each item. A verbatim list of the 22 value rating items is presented in Figure 1.

The 18-item battery contained descriptions of 17 human values (e.g., national security), which have been referred to as "terminal values" by Rokeach (1973), and one item pertaining to the value of health (i.e., the value of physical and mental well-being).[1] Respondents were required to rank the items in terms of their importance as guiding principles of life.[2] Scores ranging from one to 18 were assigned to ranks to achieve ordinal estimates of the relative importance of health and the other values. A verbatim list of the 18 value ranking items is presented in Figure 2.

The rating and ranking batteries required approximately 15 minutes to administer, on the average. Considerable variation in response times was observed. For example, in the two surveys where both rating and ranking tasks were administered (East St. Louis and Sangamon County), response times ranged from three to 48 minutes. The entire interview schedule, including standardized survey

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[1]For purposes of the 18-item battery, Rokeach's (1973) Value Survey was modified by removing "Self Respect" from the list and by substituting "Health (Physical and Mental Well-Being)."

[2]Instructions to respondents prior to the value ranking task were as follows: "On the next page are 18 values listed in alphabetical order. Your task is to rank them in order of their importance to YOU, as guiding principles in YOUR life. Study the list carefully and pick out the one value which is most important for you. Place a number 1 next to it. Then pick out the value which is second most important for you. Place a number 2 next to it . . .". These instructions continued so as to explain the use of all 18 ranks, how to make changes if desired, and to remind respondents that each rank should be used only once (see Ware and Young, 1976).

instruments to gather data regarding health status, satisfaction with medical care, demographic and socioeconomic characteristics of respondents, and health care information, required less than an hour to administer, on the average. Copies of the questionnaire booklets fielded in each survey are available elsewhere (Ware, Wright, and Snyder, 1976).

Analyses performed thus far were based on surveys of approximately 2,000 adult respondents fielded between 1973 and 1975. Four surveys involved samples drawn from general populations in central and southern Illinois, East St. Louis, and Los Angeles. For purposes of these surveys, mixed sampling designs were used to draw representative households and one or more adults from each household were selected. The fifth population consisted of undergraduate and graduate students enrolled in five communication and fine arts classes at Southern Illinois University. Students completed the questionnaires in groups under supervision. A summary of sample sizes and respondent characteristics is presented in Table 1.

The rate of complete and usable questionnaires ranged from approximately 62 to 83 percent in the three general population surveys that employed interviewer supervision of questionnaire administrations. Complete and usable returns were received from approximately 46 percent of respondents in the general population survey that employed interviewer dropoff and mailed return of questionnaires.

Plan of Analysis

The goals of the research were to assess the scalability of health value questionnaire items and the reliability of value scores, and to

determine the extent of score variability and population differences in value placed on health in general and on specific health components.

For health value measures constructed from the 22-item rating battery, the specific psychometric goals of the research were to: (a) empirically test hypothesized scales constructed to measure value placed on physical, mental, and social health and the value of health behavior; (b) evaluate the discriminant validity of items in relation to scales; and (c) assess the reliability of scale scores. For the 18-item health value ranking battery, the specific goals of the psychometric studies were to: (a) assess the reliability of value rankings; and (b) determine the relationship between the importance placed on health and on other personal values. To guard against population-specific results, psychometric analyses were independently replicated using data from the five surveys.

The extent of population differences in value placed on health was assessed by contrasting value ratings and rankings across field tests and across demographic and socioeconomic groups of interest within field rests. For purposes of comparisons across field test sites, mean scores were computed and mean differences were expressed as proportions of the population standard deviation. Thus, the analyses were descriptive and focused on the magnitude of differences. Four demographic and socioeconomic variables (age, education, income, and sex) were selected for studies of population differences within field test sites. Comparisons within sites were made by forming logical groups for each variable (e.g., collapsing age into groups defined by ten-year intervals) and testing for mean differences using analysis of variance. Inspection of means for these groups facilitated

a preliminary search for nonlinear trends in group means. The product-moment formula was used to compute correlations between demographic and socioeconomic variables and value placed on health. In the two field tests where value rating and ranking batteries were administered to the same respondents, hypotheses about population differences were tested using both methods and results were compared.

Scaling of Items

Any study based on questionnaire data can only be as good as the questionnaire items that are employed. Findings regarding population differences, for example, reflect both the soundness of theory underlying hypothesized relationships and the adequacy of the measures. Therefore, to achieve the best possible measures, extensive evaluation of value rating and ranking items using psychometric criteria was performed before studying population differences in values placed on health.

Prior to testing the scale placement of the 22 value rating items, they were grouped according to the three health value constructs they were hypothesized to measure: Physical Health (8 items), Mental Health (3 items), and Social Health (3 items). The three health value constructs and specific item groupings that were hypothesized based on the theoretical and empirical literature on health status assessment are shown in Figure 2. There was no prior theoretical or empirical basis for hypothesizing the health value constructs measured by eight of the 22 value rating items.

To determine the extent to which items in each of the three hypothesized groupings measured the same health value dimension and to

explore the possibility that the items defined one or more unhypothesized value dimensions, product-moment correlations among the 22 value rating items were factor analyzed independently using data from two surveys (East St. Louis and Sangamon County, Illinois). The Alpha Method (Kaiser and Caffrey, 1965) was used to extract principal factors. After evaluation of the unrotated solutions, major factors (those associated with eigenvalues greater than unity) were rotated to orthogonal simple structure (using a Varimax rotation [Kaiser, 1958]) to facilitate interpretation.

Items in each of the three hypothesized groupings that had one high loading ($\pm$0.40 or greater) on one and the same rotated factor in both field tests were retained and used to score that factor.[1] To further test the items in the three hypothesized groupings and those in a fourth grouping identified during factor analysis, criteria of discriminant validity were applied.[2] To satisfy discriminant validity criteria (described in detail elsewhere [Ware and Young, 1976]), each item-scale correlation (corrected for the effect of relevant item inclusion) had to be higher for the health value construct (scale) the item was hypothesized to measure than for all of other scales that employed the same method of measurement.

[1]Item variances tended to be nearly equal and the magnitude of loadings across items primarily measuring the same factor was very similar. Thus, it was not necessary to standardize item scores or to employ factor score coefficients during the computation of factor scores. Unit weights were assigned to items having one high loading on the same factor; zero weights were assigned to all other items. Thus, factors were scored by taking the simple algebraic sum of scores for items having high loadings on one and the same factor (see factor scaling as described by Armor, 1974).

[2]A FORTRAN program entitled "Analysis of Item and Test Homogeneity" (ANLITH) written by Thomas Gronek (IBM Corporation) and Thomas Tyler (Southern Illinois University at Carbondale) was used for this purpose.

Reliability

Test-retest reliability estimates were obtained for value ranking items and scales during each of four field tests by computing correlations between scores obtained approximately six weeks apart from the same respondents (N = 441). Internal-consistency reliability for both rating and ranking scales was estimated using Cronbach's (1951) Alpha coefficient and data obtained from all respondents. The two approaches to reliability estimation were based on different models of true score variance. Internal-consistency estimates include only common variance in the estimate of reliable variance, and yield lower-bound estimates of the proportion of total measured variance due to true score. Test-retest estimates include both common and unique variance in the reliability component of the model. To the extent that items reflect unique variance and scores for value constructs are stable over time, test-retest estimates should exceed internal-consistency estimates of reliability. To the extent that value constructs change between administrations, internal-consistency estimates of reliability should exceed test-retest estimates (assuming other components of variance remain constant).

III. RESULTS

Psychometric Studies

Construction of Scales. All 14 of the 22 rating items hypothesized to measure the value placed on physical, mental, and social health satisfied factor analytic criteria and discriminant validity criteria of the multitrait scaling analysis. Rotated and unrotated factor solutions for these items and detailed results of discriminant validity tests are presented and discussed elsewhere (Ware and Young, 1976). All three hypothesized item groupings appeared as factors in both field tests where value rating items were studied. No errors were observed in 56 tests of discriminant validity criteria.

In addition to the three hypothesized health value rating factors, a fourth factor (defined by three items) was identified in both field tests and was confirmed without scaling errors in tests of discriminant validity. On the basis of interpretation of the manifest content of items in each factor, the three hypothesized factors were labeled Value of Physical Health, Value of Mental Health, and Value of Social Health. The fourth factor, which was not hypothesized prior to the first field test, was labeled Value of Health Behavior.

Scaling studies were not conclusive for five of the 22 value rating items and the items were not included in the rating scales. The 17 value rating items that satisfied factor analytic and discriminant validity criteria in both field tests were used to construct four summated rating scales containing from three to eight items each (see Figure 1). Scales pertaining to mental and social health values and the value of health

behavior contained three items each and their scores had the potential to range from three to 15. Scores for the Value of Physical Health Scale, which contained eight items, had the potential to range from eight to 40. For all scales, a high score defined high value.

Factor analyses of correlations among the 18 value ranking items in the second battery identified three dimensions of value orientation.[1] One of these was obviously health-related: it was associated with a high loading for the item pertaining to relative value of health. The similarity of value ranking factors across field tests was studied by inspection and by computing factor vector similarity coefficients, as suggested by Kaiser et al. (1971). Despite the tendency for factors to be confirmed across field tests, they were difficult to interpret. Value ranking items in the second battery were intended to be heterogeneous; thus, the major factors derived from correlations among the items defined very general value orientations. To avoid confusion that might result from disagreement over interpretation, each value ranking factor (VRF) was assigned a Roman numeral; for example, the first rotated factor was labeled VRF-I. Further interpretation and labeling of these factors was postponed pending studies of the validity of VRF scores (see Ware and Young, 1976).

Thirteen of the 18 value ranking items tended to have high loadings on the same VRFs across field tests; the five items that did

[1]The problem of spurious correlations with ipsative data was handled by factor analysis of a sixth matrix of correlations computed for random ipsative data and plot of eigenvalues for random factors. The slope of the line in the plot of eigenvalues for random ipsative factors served as a standard in determining the importance of factors derived from each of the five surveys.

not were eliminated. Retained items were enumerated so that 18 equaled the highest value score and one equaled the lowest score. The items were grouped as shown in Figure 3 and the simple algebraic sum of scores for items in each group was computed, taking into account the sign that was consistently associated with each item in the factor analyses across field tests (as shown in Figure 3). For example, the highest possible numeric score for VRF-II (i.e., a score of 66)[1] indicated that a high value had been placed on Health and Salvation and that a low value had been placed on Exciting Life and Sense of Accomplishment. The lowest possible numeric score for VRF-II (i.e., a score of 10) indicated the reverse value orientation, namely, low value for Health and Salvation and high value for Exciting Life and Sense of Accomplishment.

The relative value of health item, but not VRF-II (which contained that item), correlated significantly with the Physical Health rating scale in East St. Louis ($r=0.11$, $p<0.025$) and Sangamon County ($r=0.21$, $p<0.001$). Mental and social health value rating scales were not significantly related to the relative value of health item or VRF-II in either field test.

Reliability. A summary of internal-consistency and test-retest reliability coefficients for value ratings and rankings is presented in Table 2. Coefficients are summarized separately for the single-item measure of relative value of health contained in the 18-item

[1]Note that 66 is the sum of the four numerically highest ranks (18,17,16, and 15).

battery, the VRF scale containing that item, the other two VRF scales, and the four health value rating scales. For both test-retest and internal-consistency estimates, the first four data columns indicate the total number of coefficients on which each summary was based as well as the highest, lowest, and median coefficients across field tests.

Several trends are apparent in these data. Test-retest coefficients for value rankings tended to be low to moderate in magnitude, ranging from 0.30 to 0.72. As would be expected given that common and unique reliable variance were pooled when VRF scales were constructed, VRF scores were consistently more reliable (in terms of test-retest coefficients) than scores for the individual items contained in the scales. VRF-II, which contained the health value ranking item, was at least as reliable as the other two VRF scales. Internal-consistency reliability coefficients for the four health value rating scales ranged from 0.67 to 0.90 and were consistently higher than coefficients for VRF scales and the relative value of health ranking item.

Population differences in reliability findings, which are not apparent in the summary of results, are also noteworthy. Reliability coefficients for urban black respondents sampled in East St. Louis were consistently lowest. Reliability coefficients were consistently highest for university students and tended to be next highest for Sangamon County respondents, the next most educated population studied. Analyses of reliability data for groups differing in education within populations further indicated that value scores (particularly value

rankings) tended to be least reliable for less-educated respondents (Ware and Young, 1976).

Population Differences in Values

Relative Value of Health. The first analyses were performed to determine the importance of Health in relation to other value constructs and whether variability in health value scores was sufficient to warrant further study. Table 3 presents the median (MED) rank and composite rank order (CRO)[1] observed for Health and for other values in the 18-item ranking instrument in each of five field tests. Median ranks for Health ranged from 2.3 to 4.7; the CRO for these medians was unity in all field tests. Thus, in the aggregate, Health was clearly valued most. However, as evidenced by the fact that median ranks for Health did not achieve unity, there was noteworthy variability in ranks assigned to Health both within and between field tests. Whereas Health was rarely ranked lowest in importance, other values were often ranked higher than Health (see Table 4). As many as 40 percent and as few as 20 percent of respondents (across field tests), for example, did not include Health in the first five ranks; a value other than Health was ranked highest the great majority of the time in all field tests. Included among the values most frequently ranked higher than Health were Family Security, Happiness, World at Peace, and Salvation (data not reported; see Ware and Young, 1976).

To further facilitate comparisons of relative values across field tests, means and standard deviations for the relative value of

[1]The composite rank order, which was computed independently in each field test, is the rank order of medians across 18 values.

health (RVH) item and VRF-II, which contained that item, are presented in Table 5. For purposes of these analyses, RVH was scored so that a high number indicated high value. Differences among RVH scores were significant; scores tended to be lowest for university students followed by urban blacks in East St. Louis. The largest difference in RVH between university students and respondents in a general population was approximately two-thirds of a standard deviation. Differences among the general populations with regard to RVH tended to be smaller; the largest difference (approximately one-third of a standard deviation) was observed between East St. Louis and Los Angeles County (higher for the latter).

A somewhat different picture was apparent when relative value orientations were viewed in terms of VRF-II, which contained the RVH item and three other items (as defined in Figure 3). Los Angeles County respondents tended to score lowest by as much as two-thirds of a standard deviation. This discrepancy in results between the RVH item and VRF-II was traced to the tendency of Los Angeles County respondents to assign low ranks to Salvation.

Health Value Ratings. Noteworthy differences in value placed on Health were also apparent in comparisons of mean scores for the four value rating scales fielded in Sangamon County and East St. Louis (see Table 6). Specifically, East St. Louis respondents tended to assign greater importance to both Physical Health and Health Behavior than respondents in Sangamon County. In the case of Physical Health, the magnitude of difference in mean scores was approximately one-third of a standard deviation. In the case of Health Behavior, the magnitude of mean difference was approximately two-thirds of a standard deviation.

Differences in the value placed on the three components of health status and health behavior defined by rating scales were also observed when scale scores were expressed as percentages of the total possible score (see the two right-hand columns in Table 6). The pattern of results also clearly differed across field tests. For white middle-class respondents in Sangamon County, highest value was placed on Mental Health followed by Physical and Social Health (both approximately one-half of a standard deviation lower) and by Health Behavior. (approximately a full standard deviation lower). For urban blacks in East St. Louis, both Physical and Mental Health were valued highly followed by Social Health and Health Behavior (both approximately two-thirds of a standard deviation lower.)

With respect to differences in value scores between field tests, conclusions were not the same for the relative value of health measure as they were for health value ratings. Physical Health was clearly rated higher in value by East St. Louis as opposed to Sangamon County respondents. When forced to view Health in relation to other values, however, East St. Louis and Sangamon County respondents did not differ (see Table 5).

Demographic and Socioeconomic Variables. In addition to the comparisons of value rating and ranking scores across field tests described in the preceding section, associations between health values and demographic and socioeconomic variables were studied within field tests. Several trends were apparent. First, results across field tests indicated that scores for VRF-II and (to a lesser extent) the rank of health increased with age (see Table 7), decreased with

education (see Table 8) and were greater for women than for men (see Table 9). Trends regarding associations between income and the rank of health and VRF-II were weaker and less often significant; a negative relationship between income and value of health was suggested (see Table 10).

In the case of health values and age, education, and sex, population differences were larger in magnitude for VRF-II, which included the rank of health item, than for the health ranking item alone. In other words, when the relative value of health was defined in terms of a more general and more reliably measured health-related value orientation (i.e., VRF-II), population differences were easier to detect. (Recall that high scores for VRF-II indicate high value for Health and Salvation and low value for Sense of Accomplishment and Exciting Life). Thus, men and younger and more educated persons tended to place high value on accomplishment and excitement and low value on health and salvation.

The direction of significant associations between health values and demographic and socioeconomic variables within field tests were consistent for value ranking and rating measures with only one exception (education groups in East St. Louis; see Table 8). Significant associations differed in direction across field tests in only one instance. Physical Health value ratings increased with education in East St. Louis and decreased with education in Sangamon County (see Table 8).

Consistent with the generally lower reliability coefficients observed for East St. Louis respondents, the proportion of significant

associations (only one-fourth) between health values and demographic and socioeconomic variables was clearly lowest in that field test. It is also possible that the shape of the income distribution (right-skewed) in East St. Louis contributed to the difficulty in detecting associations between income and health values in that field test. Nearly two-thirds (15 of 24) of the associations between health values and demographic and socioeconomic variables were significant in Sangamon County, where reliability coefficients tended to be highest.

IV. SUMMARY AND DISCUSSION

This paper focused on issues involved in the conceptualization and measurement of value placed on health. Specifically, the following questions were addressed: How important is health as a value? Is there enough variability in the value placed on health to warrant inclusion of health in value surveys? Do populations differ in value placed on health (i.e., to what extent are demographic and socio-economic variables associated with the value placed on health)? What is the dimensionality of health values (i.e., can physical, mental, and social health value constructs be distinguished)? What are some of the methodological issues involved in measuring value placed on health?

Two approaches to the measurement of value placed on health were studied. The first method employed a general definition of health (in terms of physical and mental well-being) and a ranking task to operationalize value of health as importance in relation to other personal values (e.g., national security). The second method focused on specific health status constructs (physical, mental, and social) and health behavior and yielded ratings of health values on an importance continuum.

Importance of Health

Consistent with hypotheses (Bull, 1941; Freeman, et al., 1972; Rokeach, 1973), results from all five field tests strongly support the importance of health as a value. However, high value was also consistently placed on Happiness, Family Security, and Freedom in all surveys fielded during the current research. These values have been

ranked high in importance in other value surveys that did not include Health (Rokeach, 1973; Feather, 1975).

It is clear that the variability of rating and ranking scores obtained with health value surveys is sufficient to warrant measurement of value placed on Health using these methods. Whereas greatest importance was placed on Health more often than any of the other 17 values included in the modified Rokeach (1973) Value Survey, there was considerable variability in health value rankings. Health was assigned highest value by no more than 31 percent of the respondents across field tests (only 18 percent of the university students ranked Health highest). Health was assigned the first two or three ranks about half of the time, and was ranked fifth or lower in importance by as many as one-third of the respondents across field tests. As will be discussed below, subgroups of interest within general populations (e.g., men, the very young, and the more educated) assigned even less relative importance to their health. Considerable variability was also observed in ratings of the importance of specific health status components (e.g., physical, mental, social). Thus, whereas improvements in health value surveys are necessary to achieve precise tests of hypotheses regarding health values, current study findings clearly indicate that variability in health value scores is sufficient to warrant inclusion of health value constructs in value surveys.

Population Differences

When demographic and socioeconomic variables were studied in relation to health values, some consistent results and large differences were observed. All health constructs were valued more by women, persons

who were older, and those with less income. Thus, it appears that some group differences in health values are large and consistent across populations and across rating and ranking methods. In the case of education, however, discrepancies in results were observed across field tests. These population differences should be studied further before generalizing conclusions about the relationships in question.

Correlations between value of health and sociodemographic variables suggest that health value measures may be useful in increasing understanding of why sociodemographic variables have been linked to differences in use of health care services (e.g., greater use of services by women may reflect differences in health value orientations of men and women). Another implication of these findings is that it may be necessary to take into account age, education, income, and sex differences in value placed on health when health status assessments are scaled using health value preferences for purposes of constructing a population health index (e.g., Patrick, et al., 1973; Carter, et al., 1976). The practice of generalizing average value preference weights for health status constructs to all persons in general populations is not supported by current study findings.

Conceptual and Methodological Issues

Dimensionality of Health Values. The psychometric studies of health value rating items suggest that health values can be conceptualized along the lines of physical, mental, and social components of health status and that it is possible to construct scales to distinguish among the values placed on those components. Although there was a tendency for persons who place high value on their health to value

physical, mental, and social health status components, it is clear that populations do not value a given health status component the same, and that individuals often place different value on different components of health status.

Reliability. The failure of health value surveys (particularly those employing ranking tasks) fielded during the current research to consistently achieve high reliability is a noteworthy constraint on their use in general populations. Test-retest reliability coefficients for value rankings were in the moderate to high range for university students in the current research and were comparable to those reported by others for similar questionnaires (Rokeach, 1973; Feather, 1975). However, the same value ranking tasks yielded much lower test-retest reliability coefficients in general populations (particularly those involving respondents with less than a high school education). Scores for scales to measure general health perceptions and patient satisfaction tended to be much more reliable in these populations (Ware and Karmos, 1976; Ware, Snyder, and Wright, 1976); thus, this measurement dilemma is somewhat unique to health value constructs and/or current study methods. Perhaps less complicated ranking tasks would result in improved reliability for health value scores. For example, relative health values could be estimated by asking respondents to rank health and a smaller number of other values than 17 (as required in the current research). Another solution to the reliability problem may be construction of health value scales from multiple measures of the value of each health component (e.g., the value rating scales that were constructed during the current research).

These reliability findings have implications for the interpretation of statistical parameters for health values. First, it should be noted that confidence intervals about central tendency estimates for health values (particularly those computed from the 18-item battery) are likely to be large. In addition to this loss of precision, substantial downward bias in correlation coefficients used to estimate associations between health values and other variables should be anticipated (due to poor reliability), particularly in disadvantaged populations. These effects and biases can be taken into account during statistical analyses if reliability estimates are obtained.

Second, given the substantial difference between reliability estimates for health value scores in studies of university students versus respondents in general population surveys (particularly those based on ranking tasks), the practice of generalizing reliability estimates obtained for students to general populations (Rokeach, 1973; Feather, 1975) is questionable. In the absence of satisfactory reliability estimates, lack of perfect reliability should always be considered as an alternative explanation for insignificant differences and weak associations in studies of health values.

Validity. The significant relationships observed between the relative value of health ranking item and the physical health rating scale constitute convergent evidence of validity. However, the relationships were weak in both field tests. These results exemplify one consequence of poor reliability, namely, unsatisfactory precision for purposes of hypothesis testing.

Given that the rank assigned to Health was significantly related only to ratings of Physical Health and that insignificant trends for

health value rankings and ratings of Mental and Social Health were observed in both directions, it may be that rankings of the relative value of health primarily reflect the relative value of Physical Health. Thus, "health" in value ranking instruments may connote Physical Health. This interpretation of health is consistent with other findings, for example, results indicating that people tend to focus more on their physical (as opposed to mental) health when they are asked to rate "health in general" (Ware, 1976; Johnston and Ware, 1976).

The relative value of Mental Health appears to have been better tapped by value ranking factors that were not associated or were only weakly associated with the health value ranking item. VRF-III, for example, which focused on the relative value of Wisdom and Inner Harmony, correlated significantly with the rating scale to measure Mental Health whereas the relative value of health item and VRF-II (which contained that item) did not. Thus, VRF-III appears to be a better measure of mental health values than VRF-II and should be studied further in that regard.

Another plausible explanation for the weak relationship between ratings of Physical Health values and relative health value rankings warrants further investigation. It is possible that the relative value of health is a different construct from an absolute rating of the value of health. On the face of it, the rating measures fielded during the current research appear to tap the importance of specific health constructs without regard to the many tradeoffs that may be required in dealing with finite resources. Hence, health value rating measures may reflect absolute value and not current priorities or the importance

of health when tradeoffs are involved. On the other hand, value ranking tasks and resource allocation tasks[1] require respondents to establish and to declare their priorities and, hence, focus on relative importance. Thus, results of ranking tasks (like the 18-item battery in the current research) and resource allocation tasks should agree more with each other than either would agree with results of value rating tasks. The findings of an experiment with university students support this hypothesis (Ware and Young, 1976). The proportion of dollars (from a fixed amount) allocated to health care services was substantially correlated with the relative value placed on health (i.e., the rank of health in relation to other values) but was not correlated with ratings of the absolute importance of health. Thus, it may be that the absolute importance of health (as defined by ratings) and the relative importance of health (as defined by rankings and resource allocation tasks) should be treated differently in a theoretical conceptualization of health values. Whether ratings or rankings are more sensitive to the health-related forces that act on individuals and which of the two health value constructs they tap is more influential as a standard during health care decision-making remain to be determined.

Empirical tests of the scale placement of value rating items substantially confirmed operational definitions of physical, mental, and social health values. Given the clarity and consistency of results across field tests, the scaling studies support the construct validity

[1]Resource allocation tasks require respondents, for example, to indicate how they would spend a fixed amount of money (e.g., how much for health care, recreational facilities, crime prevention, vocational training). Value is inferred from the proportions.

of the value rating scales. Significant relationships between health value rating scores and age and sex were also consistent with predictions from theory (i.e., health increased in value with age and was valued more by women). Hence, the construct validity of these survey measures is also supported by findings regarding population differences in health values.

The validity of health value measures, however, has by no means been thoroughly addressed in the analyses that were described. Forty hypotheses derived from value theory were tested during the current research to provide an empirical basis for further development of value theory and to test the validity of value rating and ranking measures; findings are reported elsewhere (Ware and Young, 1976). Briefly, results were consistent with value theory as outlined in the Introduction and constituted at least weak support for the construct validity of current study measures. Specifically, in terms of favorable results, significant relationships between health value rating and/or ranking scores and validity variables in seven categories[1] were (with very few exceptions) in the hypothesized direction. On the other hand, tests of hypotheses yielded nonsignificant results more often than not. At least in part, frequent failures to achieve statistical significance reflect the poor precision achieved by value rating and ranking measures (as noted in the discussion of reliability findings).

[1]Forty variables in seven categories were studied (direction of relationship with value placed on health is noted in parentheses): measures of objective health status constructs (-); measures of subjective health status constructs (-); importance placed on desirable characteristics of health care services (+); attitudes toward doctors and medical care services (-); resources allocated to health care services (+); intention/propensity to assume the patient role (+); and use of health care services (+).

The pattern of results also probably reflects an oversimplification of health value theory. It appears that relationships between health values and demographic and socioeconomic variables are not the same in all populations. For example, the value placed on physical health increased significantly with education for urban blacks in East St. Louis and decreased significantly with education for middle-class whites in Sangamon County. If results indicating population differences in these relationships are replicated, value theory must be expanded to explain those differences, and validity analyses need to be performed independently for population groups.

Finally, one suggestion offered in our first preliminary report on health values (Ware, Young, Snyder, and Wright, 1974) warrants repetition. That point pertains to the advantages of a broad conceptualization of value orientations. It is very important to measure a wide range of values, including values that are not obviously health-related (e.g., Social Recognition, Freedom, Equality), when values are operationalized in health care research. Although the validity results mentioned in this paper only hint at the usefulness of a comprehensive conceptualization of health values, predictive validity studies reported elsewhere (Ware and Young, 1976) clearly illustrate this point. For example, tests of the explanatory power of value measures in relation to use of health care services showed that value measures not explicitly tapping health values added significantly to predictive models that included the health value rating scales and VRF-II.

Some Suggestions for Future Research

In the absence of agreed-upon criteria of the value of health, comparisons among measures based on different methods are recommended to better understand the validity of health value scores and how specific measures should be interpreted. For purposes of these studies, health value constructs should be defined at the same level of specificity across methods to isolate method effects on scores and to permit tests of convergent and discriminant validity. Unfortunately, the rating scales constructed to measure health values in the current research focused on more specific health value constructs than did the ranking items used to measure relative values.

It also seems important to field health value surveys in general populations to the extent practical; given that data quality in general and that reliability of ratings and rankings in particular appear to be lower in general populations than for university students, methodological research should emphasize the former. Other characteristics of respondent samples should be kept in mind when interpreting the results of methodological studies. Methods of estimating the value of health that are successful in the university may not be successful in general populations. Also, university students appear to have substantially different value orientations from those observed in persons outside the university.

Whereas it follows that health care researchers interested in the role of values in a model of health status and health and illness behavior would think first of health values, it appears that a more comprehensive conceptualization of value orientations will lead to

the best predictions (Ware and Young, 1976). Thus, future value surveys should include health values and measures of value constructs not explicitly pertaining to health.

Finally, although the review of the literature conducted during the current research was not exhaustive (see Ware and Young, 1976), it suggests that a well-specified theoretical model of the antecedents and consequences of differences in health value orientation is lacking. An improved theoretical conceptualization of health values would greatly facilitate futue research.

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Figure 1

VERBATIM ITEMS CONTAINED IN THE HEALTH VALUE RATING QUESTIONNAIRE

Number[a]	Item	Hypothesis[b]
1	Being free of illness.	P
2	Understanding myself.	-
3	Having true friendship.	S
4	Getting the right amount of sleep.	-
5	Adapting to changes in my life.	-
6	Being able to fight off disease.	P
7	Getting affection from others.	-
8	Being safe from accidents and injuries.	P
9	Knowing how to take care of myself.	-
10	Getting along with the people I know.	S
11	Being well all of the time.	P
12	Having a healthy mind.	M
13	Eating well.	-
14	Being safe from disease.	P
15	Having good relationships with other people.	S
16	Being free from pain.	P
17	Accepting myself the way I am.	M
18	Having a comfortable life.	-
19	Having a regular medical check-up.	-
20	Having a healthy body.	P
21	Having peace of mind.	M
22	Knowing how to keep from getting sick.	P

[a]Indicates questionnaire placement.

[b]Hypothesized health value construct: P=Physical Health; M=Mental; S=Social; a blank indicates that a hypothesis was not stated in advance.
Note: items 4, 13, and 19 were used to score Prevention.

Figure 2

VERBATIM ITEMS CONTAINED IN THE
MODIFIED ROKEACH VALUE SURVEY

A COMFORTABLE LIFE (a prosperous life)
AN EXCITING LIFE (a stimulating, active life)
A SENSE OF ACCOMPLISHMENT (lasting contribution)
A WORLD AT PEACE (free of war and conflict)
A WORLD OF BEAUTY (beauty of nature and the arts)
EQUALITY (brotherhood, equal opportunity for all)
FAMILY SECURITY (taking care of loved ones)
FREEDOM (independence, free choice)
HAPPINESS (contentedness)
HEALTH (physical and mental well-being)
INNER HARMONY (freedom from inner conflict)
MATURE LOVE (sexual and spiritual intimacy)
NATIONAL SECURITY (protection from attack)
PLEASURE (an enjoyable, leisurely life)
SALVATION (saved, eternal life)
SOCIAL RECOGNITION (respect, admiration)
TRUE FRIENDSHIP (close companionship)
WISDOM (mature understanding of life)

Figure 3

ITEMS AND DIRECTION OF SCORING FOR
VALUE RANKING FACTOR SCALES

Factor Scales	Abbreviated Item Content	Scoring[a]
VRF-I[b]	Happiness	+
	Mature Love	+
	Equality	-
	National Security	-
	World at Peace	-
VRF-II	Health	+
	Salvation	+
	Exciting Life	-
	Sense of Accomplishment	-
VRF-III	Inner Harmony	+
	Wisdom	+
	Comfortable Life	-
	Pleasure	-

[a] "+" indicates high value associated with high numeric score; "-" indicates high value associated with low numeric score.

[b] VRF = Value Ranking Factor.

Table 1

SUMMARY OF RESPONDENT CHARACTERISTICS, FIVE FIELD TESTS

Characteristics	Field Tests[a]				
	TRC	ESL	SAC	LAC	UNS
Sample Size	433	323	432	640	345
Sex					
Male (%)	24	19	22	63	64
Female (%)	76	81	78	37	36
Race					
White (%)	88	10	97	65	93
Nonwhite (%)	12	90	3	35	7
Age					
Minimum	16	17	17	18	17
Maximum	83	88	84	92	39
Median	52	43	45	43	21
Family Income ($)					
Minimum	0	0	≤2,000	0	b
Maximum	20,000+	20,000+	20,000+	30,000+	b
Median	7,400	5,400	11,900	9,500	12,000
Education (yrs.)					
Minimum	2	3	3	0	13
Maximum	20	20+	20+	20+	18
Median	11	11	12	12	b

[a]TRC = Tri County
ESL = East St. Louis
SAC = Sangamon County
LAC = Los Angeles County
UNS = University Students

[b]Not available.

Table 2

SUMMARY OF TEST-RETEST AND INTERNAL-CONSISTENCY RELIABILITY COEFFICIENTS FOR HEALTH VALUE MEASURES

Measure/Value Dimension	Test-Retest[a]				Internal-Consistency[a]			
	#	H	M	L	#	H	M	L
Value Rankings								
Single-item	4	.53	.46	.30	-[b]	-	-	-
VRF-II	3	.72	.50	.44	4	.55	.45	.30
Other VRF Scales	6	.68	.50	.34	8	.56	.54	.39
Value Ratings								
Physical Health	0	-[c]	-	-	2	.90	-[d]	.86
Mental Health	0	-	-	-	2	.76	-	.73
Social Health	0	-	-	-	2	.78	-	.76
Prevention	0	-	-	-	2	.68	-	.67

[a] # = number of coefficients across field tests; H = highest coefficient; M = median; L = lowest.

[b] Not applicable to single-item measures.

[c] Not studied.

[d] Not applicable, estimated in only two field tests.

Table 3

MEDIANS AND COMPOSITE RANK ORDERS FOR VALUE RANKINGS, FIVE FIELD TESTS

Values	Field Tests[a]									
	TC		ESL		SC		LAC		US	
	MED[b]	CRO[c]	MED	CRO	MED	CRO	MED	CRO	MED	CRO
Comfortable Life	9.8	10	7.4	4	10.9	12	8.7	9	11.2	13
Exciting Life	15.1	18	13.2	17	14.1	16	11.7	13	10.4	11
Sense of Accomplishment	11.1	12	11.5	13	9.9	11	8.4	7	9.7	9
World at Peace	5.4	4	8.6	8	8.3	8.5	8.5	8	9.2	8
World of Beauty	14.6	17	14.4	18	14.4	18	13.2	15	12.5	15
Equality	10.6	11	8.3	7	11.6	13	11.5	12	10.6	12
Family Security	4.3	3	5.4	3	3.9	2	4.1	2	10.1	10
Freedom	7.5	6	7.9	6	7.8	5	7.4	4	5.5	3
Happiness	6.2	5	5.1	2	5.7	3	5.5	3	5.5	2
Health	2.3	1	2.8	1	2.8	1	3.0	1	4.7	1
Inner Harmony	9.3	9	11.1	12	8.1	7	8.2	6	5.6	4
Mature Love	11.1	13	10.5	11	8.8	10	9.6	11	6.8	6
National Security	11.1	14	12.8	15	13.1	14	13.5	16	16.2	18
Pleasure	14.0	15	12.8	14	13.6	15	12.4	14	12.4	14
Salvation	3.3	2	7.5	5	7.0	4	14.5	18	15.8	17
Social Recognition	14.4	16	13.1	16	14.3	17	14.4	17	14.7	16
True Friendship	9.1	8	9.6	10	8.3	8.5	9.0	10	7.1	7
Wisdom	8.7	7	8.7	9	8.0	6	8.1	5	6.4	5

[a]TC = Tri-County (N=433); ESL = East St. Louis (N=323); SC = Sangamon County (N=432); LAC = Los Angeles County (N=525); US = University Students (N=345).

[b]MED = Median.

[c]CRO = Composite Rank Order (see text).

Table 4

FREQUENCY DISTRIBUTIONS OF RANKS ASSIGNED TO HEALTH, FIVE FIELD TESTS

	Field Tests									
	Tri-County		Students		East St. Louis		Sangamon County		Los Angeles	
Ranks	f	cum. %	f	cum. %	f	cum. %	f	cum. %	f	cum. %
1	130	30.7	63	18.3	82	25.6	127	29.7	136	27.3
2	106	55.8	41	30.1	66	46.2	73	46.7	84	44.1
3	51	67.8	33	39.7	39	58.4	55	59.6	59	55.9
4	38	76.8	31	48.7	31	68.1	50	71.3	51	66.1
5	17	80.9	29	57.1	21	74.7	28	77.8	39	73.9
6	20	85.6	29	65.5	11	78.1	26	83.9	31	80.2
7	15	89.1	19	71.0	8	80.6	12	86.7	21	84.4
8	10	91.5	20	76.8	8	83.1	11	89.3	15	87.4
9	10	93.9	19	82.3	14	87.5	8	91.1	16	90.6
10	4	94.8	11	85.5	12	91.2	9	93.2	15	93.6
11	3	95.5	14	89.6	6	93.1	9	95.3	8	95.2
12	4	96.5	14	93.6	6	95.0	6	96.7	9	97.0
13	4	97.4	6	95.4	2	95.6	6	98.1	5	98.0
14	5	98.6	7	97.4	5	97.2	2	98.6	1	98.2
15	2	99.1	3	98.3	5	98.7	4	99.5	2	98.6
16	3	99.8	4	99.4	1	99.1	1	99.8	3	99.2
17	1	100.0	0	99.4	3	100.0	1	100.0	2	99.6
18	0	100.0	2	100.0	0	100.0	0	100.0	2	100.0
Totals	423	100.0	345	100.0	320	100.0	428	100.0	499	100.0

Table 5

MEANS AND STANDARD DEVIATIONS (IN PARENTHESES) FOR HEALTH VALUE RANKINGS, FIVE FIELD TESTS

Health Value Measures	Field Tests[a]					F[b]
	ESL	SAC	TRC	LAC	UNS	
Relative Value of Health	14.7 (3.8)	15.2 (3.3)	15.5 (3.2)	15.9 (3.5)	13.5 (3.8)	27.7**
VRF-II	48.3 (13.1)	48.6 (11.5)	53.6 (9.8)	41.5 (12.1)	--[c]	72.2**

[a]ESL = East St. Louis, SAC = Sangamon County, TRC = Tri-County, LAC = Los Angeles County, and UNS = University Students.

[b]F-ratio for one-way analysis of variance.

[c]Not studied.

**$p < 0.01$ (one-tailed test).

Table 6

MEANS AND STANDARD DEVIATIONS (IN PARENTHESES)
FOR VALUE RATING SCORES, TWO FIELD TESTS

	Scoring Method				
	Raw Score		Percentage of Possible Score		
Value Dimension	ESL[a]	SAC[a]	ESL	SAC	F[b]
Physical Health	29.0 (6.5)	26.8 (6.0)	72.5 (16.2)	67.0 (15.4)	23.0*
Mental Health	11.4 (2.6)	11.2 (2.2)	76.0 (17.3)	74.7 (14.8)	1.2
Social Health	9.8 (2.8)	10.0 (2.2)	65.3 (18.2)	66.7 (14.7)	1.1
Health Behavior	10.1 (2.5)	8.5 (2.3)	67.3 (16.2)	56.7 (15.0)	81.2*

[a]ESL = East St. Louis (N=320), SAC = Sangamon County (N=424).

[b]F-ratio for one-way analysis of variance.

*$p < .001$.

Table 7

MEAN HEALTH VALUE RANKINGS AND RATING SCORES
BY AGE, FOUR FIELD TESTS

Field Test/ Health Value Measure	Age Groups[a] 17-24	25-34	35-44	45-54	55-64	65-74	75-84	F[b]	r[c]
Tri County									
Rank of Health[d]	15.0	14.8	15.7	16.2	15.3	16.1	15.2	1.7	.07
VRF-II[e]	47.7	52.0	53.9	55.3	54.7	53.4	54.8	2.9**	.13**
Los Angeles County									
Rank of Health	13.4	14.1	14.9	15.7	15.2	15.1	16.0	3.4**	.16**
VRF-II	35.7	39.4	41.5	42.0	40.5	46.1	48.1	5.0**	.21**
East St. Louis									
Rank of Health	14.8	14.0	15.2	14.5	15.2	14.8	--[f]	<1	.05
VRF-II	43.1	45.2	50.4	47.9	49.7	53.4	--	4.3**	.23**
Physical Health	29.9	29.3	28.4	28.4	29.9	28.1	--	<1	-.06
Mental Health	11.9	11.5	11.0	11.4	11.3	11.2	--	<1	-.08
Social Health	9.4	9.5	9.3	10.1	10.1	10.4	--	1.4	.12**
Health Behavior	10.3	9.8	9.8	10.0	10.3	10.4	--	<1	.04
Sangamon County									
Rank of Health	14.0	14.8	15.4	15.2	15.7	15.9	14.8	1.6	.09*
VRF-II	43.2	45.8	50.0	48.8	51.1	51.9	51.9	4.1**	.19**
Physical Health	27.7	25.7	26.5	26.1	28.2	28.0	27.9	1.9	.10*
Mental Health	11.4	11.1	11.3	11.6	11.2	10.9	10.7	<1	-.04
Social Health	10.3	9.8	10.0	9.9	10.2	10.2	10.2	<1	.03
Health Behavior	8.4	8.2	8.2	8.4	9.0	9.0	9.6	2.1	.14**

[a] N for age groups ranged from 19 to 113; the median of 27 groups was 57. Standard deviations ranged from 2.6 to 4.4 for Rank of Health, from 8.4 to 13.3 for VRF-II, from 5.2 to 7.0 for Physical Health, and from 1.8 to 3.2 for Mental Health, Social Health, and Health Behavior.

[b] F-ratio for one-way analysis of variance.

[c] Product-moment correlation between age and health value.

[d] Single-item health value ranking; scored so that high number defined high value.

[e] Second value ranking factor (see text).

[f] Not computed due to small sample size.

* $p < 0.05$

** $p < 0.01$

Table 8

MEAN HEALTH VALUE RANKING AND RATING SCORES
BY EDUCATION, FOUR FIELD TESTS

Field Test/ Health Value Measure	Education in Years[a] 0-8	9-11	12	13-16	17+	F[b]	r[c]
Tri-County							
Rank of Health[d]	15.7	15.7	15.5	15.1	--[f]	<1	-.03
VRF-II[e]	54.4	54.4	53.8	51.1	--	1.5	-.14**
Los Angeles County							
Rank of Health	15.7	14.5	14.8	14.9	14.7	1.1	-.05
VRF-II	50.5	44.2	41.8	39.5	36.3	13.8**	-.32**
East St. Louis							
Rank of Health	14.4	15.1	14.8	14.2	--	<1	.04
VRF-II	49.4	48.8	48.1	45.8	--	<1	-.10*
Physical Health	28.4	28.5	29.3	30.3	--	1.1	.11*
Mental Health	10.9	10.9	11.6	12.4	--	4.7**	.18**
Social Health	9.8	9.5	9.8	10.0	--	<1	.01
Health Behavior	10.2	10.2	10.0	9.9	--	<1	.00
Sangamon County							
Rank of Health	15.7	15.2	15.5	15.0	13.6	2.6*	-.12**
VRF-II	51.1	48.8	51.4	47.3	37.1	13.9**	-.28**
Physical Health	28.2	28.3	26.8	26.7	23.5	4.0**	-.19**
Mental Health	10.8	11.6	10.9	11.6	11.3	2.3	.06
Social Health	9.9	10.2	9.8	10.4	9.8	1.6	.00
Health Behavior	8.7	9.4	8.5	8.5	7.2	4.7**	-.19**

[a] N for education groups ranged from 31 to 181; the median for 18 groups was 72. Standard deviations ranged from 2.8 to 4.1 for Rank of Health, from 9.1 to 13.6 for VRF-II, from 5.2 to 4.1 for Rank of Health, from 9.1 to 13.6 for VRF-II, from 5.2 to 7.0 for Physical Health, and from 1.8 to 3.0 for Mental Health, Social Health, and Health Behavior rating scales.

[b] F-ratio for one-way analysis of variance.

[c] Product-moment correlation between education and health value.

[d] Single-item health value ranking; scored so that high number defined high value.

[e] Second value ranking factor (see text).

[f] Not computed due to small sample size.

* $p < .05$ (one-tailed test).

** $p < .01$ (one-tailed test).

Table 9

MEAN HEALTH VALUE RANKING AND RATING SCORES AND STANDARD DEVIATIONS BY SEX, FOUR FIELD TESTS

Field Test/ Health Value Measure	Males[a] Mean	Males[a] SD	Females[a] Mean	Females[a] SD	F
Tri-County					
Health Value Rank[b]	15.4	3.7	15.6	3.1	<1
VRF-II[c]	50.9	11.0	54.4	9.2	9.8**
Los Angeles County					
Health Value Rank	14.3	3.8	15.8	2.7	19.2***
VRF-II	40.1	12.4	44.2	11.4	12.8**
East St. Louis					
Health Value Rank	14.2	4.1	14.9	3.7	1.8
VRF-II	42.9	14.8	49.5	12.4	12.7**
Physical Health	29.4	6.1	28.9	6.6	<1
Mental Health	11.5	2.6	11.3	2.6	<1
Social Health	10.2	2.7	9.7	2.8	1.5
Health Behavior	10.0	2.6	10.1	2.5	<1
Sangamon County					
Health Value Rank	14.5	3.7	15.3	3.2	4.1
VRF-II	43.7	12.8	49.9	10.8	21.5**
Physical Health	26.1	5.9	26.9	6.1	1.4
Mental Health	10.8	2.2	11.4	2.3	5.1*
Social Health	9.7	2.0	10.1	2.2	2.6*
Health Behavior	8.1	2.1	8.6	2.4	3.4*

[a]Sample sizes for males and females, respectively, were 102 and 320 in Tri-County, 315 and 168 in Los Angeles, 60 and 259 in East St. Louis, and 89 and 339 in Sangamon County.

[b]Single-item health value ranking scored so that a high number indicated high value.

[c]Second value ranking factor, which included health (see text).

*$p < 0.05$

**$p < 0.01$

Table 10

MEAN HEALTH VALUE RANKING AND RATING SCORES BY INCOME, FOUR FIELD TESTS

Field Test/ Health Value Measure	Annual Income[a] 0-4,999	5,000-8,999	9,000-14,999	15,000-19,999	20,000+	F[b]	r[c]
Tri-County							
Rank of Health[d]	15.6	15.5	15.8	14.9	14.6	<1	-.04
VRF-II[e]	54.2	52.5	54.5	52.4	49.6	1.7	-.06
Los Angeles County							
Rank of Health	14.9	14.4	14.6	15.3	15.2	<1	.05
VRF-II	44.8	42.2	39.7	39.6	39.6	4.1**	-.16**
East St. Louis							
Rank of Health	14.9	14.5	15.0	--[f]	--	<1	-.01
VRF-II	48.3	47.2	50.9	--	--	1.1	-.02
Physical Health	29.1	28.8	29.7	--	--	<1	-.04
Mental Health	11.3	11.4	11.8	--	--	<1	.05
Social Health	9.8	9.4	10.0	--	--	<1	.00
Health Behavior	10.3	10.1	10.1	--	--	<1	-.08
Sangamon County							
Rank of Health	14.7	16.1	15.1	15.2	15.0	1.3	-.02
VRF-II	49.9	49.1	49.6	49.1	44.3	3.3*	-.11**
Physical Health	27.8	28.3	27.2	26.2	25.7	2.3	-.13**
Mental Health	11.0	11.5	11.3	11.4	11.3	<1	.03
Social Health	10.2	10.0	10.2	9.9	10.1	<1	-.02
Health Behavior	9.3	9.2	8.3	8.6	8.0	3.6**	-.16**

[a] N for income groups ranged from 20 to 166; the median of 18 groups was 77. Standard deviations ranged from 2.3 to 4.4 for Rank of Health, from 7.9 to 13.8 for VRF-II, from 5.7 to 6.7 for Physical Health, and from 1.9 to 2.8 for Mental Health, Social Health, and Health Behavior.

[b] F-ratio for one-way analysis of variance.

[c] Product-moment correlation between income and health value.

[d] Single-item health value ranking; scored so that high number defined high value.

[e] Second value ranking factor (see text).

[f] Not computed due to small sample size.

* $p < 0.05$

** $p < 0.01$