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The purposes of this study were to construct a Likert scale to measure the attitudes of individuals toward their personal health, then to establish the reliability and validity of the scale.

A 22 item scale was developed from computer part whole analysis of 100 random items written and edited by experts in the field. Split-half reliability was found to be .66 by the Pearson Product Moment Coefficient, corrected to .80 by the Spearman Brown Formula. A known group validation was carried out using 100 students and 50 professional health educators.

Possible uses for the developed scale were enumerated and potentials for improvements are given in the conclusion.

Development of an Attitude Scale for Personal Health

by

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I. INTRODUCTION

This study focused on individual attitudes toward one's own personal health. Personal health was defined as the overall health status of an individual and how that individual understands and relates to his or her health status. Casual observation and formal instruments such as tests and interviews indicated that individuals vary greatly in the extent that they feel responsible and in control over the fate of their personal health. According to informal interviews and polls carried out by the author, there appeared to be a wide spectrum ranging from those who believe they have total control over their health to those who considered the whole matter to be one of chance. Also encountered in these random interviews was the concurrent phenomenon that runs from those who eagerly sought knowledge and information about concepts affecting their health to those who made no effort in this regard.

The purpose of health education is to work with individuals or groups in an attempt to deliver information, develop sound health habits, and effect changes in lifestyles which will counteract the forces leading toward disease and degeneration (Mayshark, 1972).

According to such objective evaluations as the National Youth Fitness Level Tests (Mayshark, 1972), the Framingham Massachusetts Study, and Korean and Vietnam autopsy studies, the level of individual

health and fitness varies markedly and dramatically among individuals of equal age in the United States population (Dawber, 1963). Research into the causes of these differences led to the conclusion that life-styles played an important part in the ongoing health development. Further, it was determined that individual attitudes toward personal health had an important effect upon various lifestyles. One problem facing health professionals attempting to carry out the objectives of delivering information and directing lifestyle changes was that of understanding and classifying the health status of those individuals they were attempting to influence. Methods were needed to aid the health professional in this task of defining the nature of the population with which he or she was working and for measuring potential changes which might have occurred through the health professional's efforts.

Statement of the Problem

According to the results of a question posed to 50 health related career professionals, there was no acceptable personal health attitude scale available for use in research and program designs that are carried out in the field of health education. These health professionals consisted of 28 physicians, seven dentists, eight nurses, and seven professors of health education in the Corvallis area. All members of this poll were currently practicing their profession in the community at the time of the poll.

The professionals responded to the question "Do you presently feel that there exists a viable and acceptable personal health scale, which can be utilized for measurement of personal health attitudes?"

Objectives

The principle objective of this study was to develop a Likert Scale which would measure individual attitudes toward the concept of personal health. The worthiness of this instrument was assessed and determined by the following criteria:

A. Reliability of sufficient dependability.

B. A known group validity which is significant.

Since research investigating individual attitude toward personal health is lacking, this study was regarded as a preliminary attempt to develop an empirically effective instrument to measure individual attitudes toward one's own personal health.

Assumptions

The following assumptions were made regarding the concept of personal health within the context of general health education:

1. Attitudes toward one's health are assumed to exist.
2. Attitudes toward personal health are assumed to vary among individuals.
3. A Likert Scale is an effective device for measuring attitudes.
4. Attitudes toward personal health can accurately be measured by means of a Likert Scale.
5. Attitudes toward personal health are influenced by a set of expectations which are structured around prior responses and prior learning.

Justification

A person's health permeates, directly or indirectly, every facet of his or her life. Achievement of a healthy body and mind is contingent upon many factors such as family background, education, and condi-

tion at birth. Other considerations may be life roles, attitudes, knowledge, expectations, values, prior experiences, and motivation. One important tool which could add to the resources for investigating the total health picture of an individual would be an attitude scale. An attitude scale could be utilized for development of theories related to the aquisition of personal health attitudes and to advise administrators on policy decisions that are designed to have measurable effects upon the population. A review of the literature revealed limited recent research dealing solely with a subject's attitude toward his or her personal health (Shaw, 1967).

Definition of Terms

The terms listed below are utilized with various meaning throughout the literature. However, for the purpose of this study, they will be defined as follows:

Attitudes: The relatively persistent and stable predisposition of an individual to act or react in a consistent manner toward certain objects or situations (Fishbein, 1967; Oppenheim, 1966; Sarnoff and Katz, 1954). An attitude embodies the components: behavior (overt); belief (ideation); and emotion (affective) (Sawyer and Telford, 1975). Related with this, an individual's responses on a questionnaire constitutes his/her elicited verbal attitudes (Green, 1954). In this study, a respondent's attitude toward the attitude object will be measured by the sum of his/her responses to items on the Likert Scale.

Likert Scale: A type of attitude scale consisting of a series of statements that are rated according to degree of agreement or dis-

agreement (Likert, 1932). Typically five alternatives are possible for each statement and are assigned the weights 1-5. A total score for each respondent is then obtained by summing the weighted responses for all statements.

Personal Health: The standards and qualities one attributes to his or her level of functioning are those characteristics of an individual comprising a condition in which all functions of body and mind are normally active. The World Health Organization defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (Thomas, 1970).

Limitations of the Study

Certain restrictions will be placed on the findings due to the following considerations:

1. Since the population sample selected for the study was obtained from Corvallis, Oregon, it may not represent the population from other geographical areas.
2. Restrictions will be placed on the findings due to a percentage of invalid or nonresponses commonly found in similar studies.
3. The findings may be biased due to the tendency of individuals to respond in socially desirable and acceptable ways to questions relating to personal aspects of their lives.

II REVIEW OF THE RELATED LITERATURE

An assortment of studies have been undertaken in the area of health related to assessing knowledge and attitudes toward various components of the field such as sex education, drug use, and safety. These studies were valuable in this research because they gave background information and methodology on the most direct and meaningful types of instruments available for specific types of research. Additionally, through this review it became clear that few research studies dealt directly with the analysis and recording of individual personal health attitudes. Through the effectiveness of these various studies, it was determined that a Likert type scale would be most effective and valuable in measuring personal health attitudes.

"An Inventory of Certain Practices on Health" was designed for use at the College level by the California Community Health Education Project. The inventory contained 88 statements which could be used to study actual health behavior from the standpoint of the students' health practices. The inventory was also used to study certain illnesses or health related problems which became a part of the behavior pattern. The inventory was an initial step toward recording and analyzing data related to student health practices. This data provided information about the types of students matriculating in health classes, illuminating background on habits and practices. The importance of the inventory was that it was a positive step in the direction of gathering information which could classify students according to various health behavior patterns. This information was then available for use

with studies aimed at analyzing the origins of these behaviors (Leonard, 1949).

A health and safety attitude scale for seventh graders consisting of 60 situation-response items was another attempt to measure specific safety attitudes. The scale was a projective test because it allowed students an opportunity to respond to a specific stimuli in an open ended manner. It was limited in use to studies dealing with safety and therefore dealt with specific types of course work. The scales most usable asset was that respondents were allowed to reply openly rather than being limited to terse statements, and this generated valuable information for the trained administrator (Mayshark, 1954).

An inventory for junior high students to appraise student dental health knowledge, attitudes toward dental health tests and inventories was developed. The inventory consisted of 15 practice items, 25 attitude items, and 30 multiple-choice knowledge items. The inventory was specific to the area of dental health and had little carry-over value for other health areas. But it was useful for the study of dental practices, especially since it was a triad inventory and gathered responses from three different perspectives. In this manner the response areas could be compared and reliability data was more readily available. The inventory demonstrated the research about attitudes available at the time, that attitudes were a multi-faceted measurement with a number of variables involved in each whole attitude score (Lundh, 1957).

A health attitude test encompassing the use of described health situations, was used in high school instruction. Twenty-five situations were described, and each was followed by statements such as, "What

would you do?" or, "How would you feel?" Students indicated the strength of their agreement or disagreement with each of the statements. Administrating this type of projective test was useful in generating masses of information about individuals respondents and therefore was valuable as a tool in one-on-one situations. The open-ended response style facilitated discussion between the testee and the tester. The weakness of this type of test was that it was not conducive to a controlled group study. It yielded no worthy reliability and validity was difficult to determine (Edwards, R., 1959).

A "Sex Knowledge Inventory", which measured understanding of the human reproductive system and vocabulary related to sex, added another instrument capable of measuring sex education attitudes. This inventory was specific to the area of sex education, but the information the test generated could be utilized for studies of sex education classes and the effect or lack of effect the classes had upon students matriculated in the classes. This type of knowledge inventory was useful for classifying the level of development and understanding of students prior to placement in sex education classes. The inventory generated reliable data and had a good validity (McHugh, 1959).

There was a need for a measuring tool to quantify latent personal feelings, a "Sentence Completion Health Attitude Test for College Students" was developed at Southern Illinois University, to meet this need. This sentence completion test was used by psychologists, guidance workers, and psychometrists as one of a battery of tests designed to allow patients and students a verbal outlet to semi-controlled stimuli. In this method, the subject was asked to complete a partial sentence. The results served to furnish clues as to the subjects' latent attitudes

tudes, conflicts, ignorances, and indecisiveness. Use of the test was effective at uncovering faulty attitudes that were not apparent immediately through discussions and other interactions with a respondent. As was the case with most attitude testing, the respondents did not immediately realize the extent or magnitude of his/her attitude. This type of projective test deals with the need for delivering information about a respondent which he/she could not furnish through mere questioning. Because of the nature of the inventory, a trained administrator is required to interpret results and make recommendations (Richardson, 1969).

Studies of the smoking practices of selected groups of junior and senior high school students in public schools through the use of a questionnaire, was an early attempt to analyse smoking attitudes. An additional questionnaire item made inquiry about parental smoking practices and other health habits of respondents. The questionnaire made inquiry into the growing realization that smoking habits of children are heavily related to the model provided by parents. It demonstrated how pertinent information related to a specific questionnaire can be generated and still maintain the statistical value of the instrument. Some of the questions in the study were adaptable to the current work, allowing for some modifications (Sallak, 1960).

An inventory of 75 items to be answered in terms of "agree," "disagree," or "undecided" was another attempt to scale students responses to various health topics. The subject areas included were food, diet, organic functioning and disorders, prevention of disease and treatment of injury, mental health, eyes, teeth, skin, first aid, and medical treatment. The inventory was an attempt to get at a wide

array of health related topics so that comparisons among topics for individual respondents was possible. The inventory contained some useful questions which could be modified and included in the original pool for the current study. It also provided an example of how an objective questionnaire could be written which supplies an entire spectrum of responses on individual items (Adams, 1960).

The "Development and Application of a New Health Education Appraisal Instrument," was designed to evaluate the effectiveness with which the objective of a health education course could be met. By checking the inventory, students were asked to indicate what they had learned in a variety of health areas, and whether they believed additional instruction would be helpful in determining the general level of knowledge of freshmen and sophomore groups. This instrument provided feedback information as to course effectiveness, which could then be utilized to modify health classes and make changes which would make classes more effective in meeting student needs. This was a direct attempt to modify health courses effectiveness by applying instrument generated data to modify course materials. It did not generate any information directly about the students, but rather about the course effectiveness itself (Dalis, 1961).

A more projective type of instrument was the sentence completion test to measure television health advertising and its relationship to or influence on health attitudes of ninth grade level students. Sentence stems were related to products dealing with relief from pain and tensions, products dealing with food and nutrition, and products dealing with the prevention aspects of health. It was determined that television advertising does indeed have an effect upon attitudes of the respondents. This age group appeared to be highly susceptible to

fads and pressure groups, both of which are heavily utilized in television advertising. The instrument demonstrated that this age student was more likely to be influenced by what his/her fellow students were doing than by logic or information. Peer pressure is an important factor in determining the potential strength of an attitude (Lowell, 1962).

A 100 item inventory to test health behaviors, attitudes, and knowledge was divised for use with junior high school level students. The inventory generated information which was utilized to modify and develop curriculum for health classes at the junior high level. The reliability and validity of the instrument were significant so that it could be utilized with confidence in planning curriculum materials for this age student. The findings pointed out that junior high age students is a critical age for measuring health behaviors and attitudes due to the nature of the young mind, being highly receptive and yet extremely susceptible to influences by peers and authority figures (Colebank and Johns, 1962).

To achieve a measurement of students' responses and attitudes toward personal health problems, a 75 item problem solving type inventory was developed. The "Health Behavior Inventory" was used for senior high students and it measured areas such as mental turmoil and physical adjustments to adolescence changes. This instrument was specific to the senior high area but some questions were adaptable to use in the current study due to the proximity in age and maturity of the college and high school student. The purpose of the instrument was to generate data about students in the school so that course curriculums could better meet specific student needs. Also the level of student maturity and understanding of issues such as mental turmoil and physical

adjustment were analyzed to determine what background and prior learning the students brought into the classroom. Working with another plastic population the instrument generated a wide continuum of response patterns and results (LeMaistre and Pollack, 1962).

A different aspect of health was measured with the inventory entitled "Getting Along" made up of 45 situation response items with multiple-choice answers. The inventory was designed to measure emotional health. Considered one of the most important topics in the health field, this emotional health test was useful in providing background information through useful questions capable of delving into mental health data of the respondents. Use of the inventory delineated a variety of learning styles and adaptations modes that individual students utilize in various stressful situations that require getting olong with fellow students and other individuals. The ability to adapt and interrelate with other humans is considered essential to development of strong mental health and coping skills (Lawrence, 1964).

The level of understanding by pupils of family health education was measured through a family health and sex knowledge test. Another test which was aimed at a specific subject area, it none the less supplied potential questions adaptable to the current study. The instrument was mainly concerned with uncovering myths and misunderstandings which exist on the part of junior high students in the areas of family life and sex education. In that manner the curriculum on sex education and family life could take these misunderstandings into account and plan learning units appropriate to student competence levels (Stradman, 1964).

The "Health Behavior Inventory," consisted of descriptions of a number of health problems upon which 100 multiple-choice test items

were based. This was an example of an attempt to measure the knowledge component inherent in an overall attitude. The area of knowledge was one of the most critical areas or components of attitude development that was being studied at this time. Especially pertinent to the schools since the schools are so heavily weighed toward working with the knowledge and understanding domain. This type of inventory is limited though by its lack of statistical conformity. It is worthy for generating data related to the specific group taking the test, but not for comparison studies (Reid, 1966).

An inventory test to study the knowledge of college and university students concerning their school health services and facilities brought the testing movement into the mainstream of the college health services area. The test of 166 multiple-choice items was divided into three parts. Part one consisted of 75 items and tested for the level of student use of the services and facilities. Part two contained 36 items which measured student information about services and facilities. Part three consisted of 34 items designed to measure personal data on students taking the inventory. Some of the items were adaptable to the present study because the inventory was aimed at the college population. The reliability of the instrument was good allowing for the carry over of the questions to other investigations (Southworth, 1966).

Attitudes of college health students toward drug abuse were addressed more vigorously in the literature with the coming of the so called "drug generation." One investigation related to the following research questions:

1. Do college students' perceptions of the dangerousness of specific drugs run parallel to federal government listed rankings?

2. Where do legal drugs fall on the continuum of perceived dangerousness?
3. What might be good dimensions to characterize perceptions?
4. What is the relationship among these dimensions?
5. How might a college drug education course change these perceptions?

A questionnaire concerning perception of drug usage was administered to two undergraduate drug education classes on a pre-post course basis. Data was presented in numerical tables and graphs along the dimensions of usage, dangerousness, pleasantness, and strength. There were no statistically significant changes in sources as a result of drug education courses. However, the authors concluded that the interpretations of the chosen dimensions posed discriminating problems for respondents. The study contained some good questions related to the drug education curriculum. The study was also useful in that the discussion enumerated methods for improving the inventory by making questions more specific and understandable to the respondents. The conclusion indicated that certain results are predictable if questions are biased or worded incorrectly for the specific population upon whom the questionnaire was utilized (Wong and Allen, 1975).

Whether or not attitudes toward drug abuse can be significantly changed through the use of individual and group television viewing was another area of importance due to the pervasiveness of television in the United States culture. The purpose of this research was two-fold: (1). to explore the effectiveness of the mass media as a drug education tool, and (2). to find ways to make television education more effective in stimulating meaningful learning and attitude change. The researchers

hypothesized that television instruction, experienced in the context of a structured small group, would encourage people to choose the small group method of learning, and the interaction would result in more learning and a more positive attitude. The result of the study showed that the mass media of television was an effective way to disseminate information about and change attitudes toward drug use and abuse. The experimental conditions of group viewing, however, did not show significant differences over individual television viewing (Wong and Barbatsis, 1976).

A study which utilized a Likert-type scale, measured attitude changes of students enrolled in college sex education classes. Few previous studies had dealt with sex topics since sex education classes had been offered widely in colleges only since the 1960's. The intent of the study was to compare differences in attitudes before and after the class by utilizing various categories, such as male versus female. Results of the study indicated that attitude changes were effected by a sex education course and that a Likert scale was an effective means to measure and quantify the results. The importance of this study was information available about how to utilize a Likert scale for measurement of specific health related attitudes. The study also enumerated how and why the Likert scale is the strongest means for measuring attitudes in the health domain (Dearth and Cassell, 1976).

The results of an article dealing with drug education were that even a substantial curriculum in drug education classes did not appear to produce attitude change and that such a finding was likely due to an insensitive attitude scale and/or research design which failed to isolate the real effect of such education. Attitude scaling and alter-

native research designs were related to the task of analyzing data. Finally, the successful use of an attitude scale in measuring attitude changes over the course of a drug education program was discussed. It was concluded that actual attitude changes can often be found if sufficient attention is paid to scale construction, research design, and data analysis. The work paid much attention to specifying what types of steps are required to insure adequate measurement of an attitude. The pitfalls of weaker studies were talked about and avoidance of ineffective techniques were discussed (Sawyer, 1978).

Summary of Related Literature

A review of the literature showed that scales measuring attitudes toward specific health topics have been developed. Examples of such scales are in areas such as sex education, drug education, mental health, and substance abuse. However, the author was unable to locate any scale measuring health attitudes for use in college personal health classes. There is a need for the development of an attitude scale aimed at measuring attitudes toward personal health in college students. Such an attitude scale could be utilized in education and health related research, to determine when, and to what extent, various programs and curricula effect student attitudes toward personal health.

III METHODOLOGY RESULTS AND DISCUSSION

The study consisted of two phases: (1). the development of the personal health attitude scale, and (2). the establishment of reliability and validity.

In his book Questionnaire Design and Attitude Measurement the author, Oppenheim, related the following information about the usability and value of the Likert Attitude Scale. The primary concern of the Likert scale is with unidimsionality (making sure that all the items measure the same thing). Because of this dimension, factor analysis is unnecessary to prove reliability since it is assumed that only one factor is being measured. This method also eliminates the need for judges. Instead, subjects in the trial sample place themselves on an attitude continuum for each statemnt, running from "strongly agree" to "strongly disagree" (Oppenheim, 1966).

The Likert Scale is produced in the following manner. First, an item pool is composed. This is, theoretically, all possible statements related to the attitude object in question. Following this, a sample of respondents test the pool. One-hundred respondents is considered sufficient for this task. Respondents should be similar to those on whom the scale will be used. Next, the score of each respondent is recorded to determine if the subject has a high favorable or low unfavorable attitude toward the object in question. After each item has been scored from one through five, the total score is obtained by adding individual scores. An item-analysis is carried out after the total score for the respondents has been recorded. Ideally, the item-

analysis takes place by correlating each item with some reliable outside criterion, such as known groups, and only the items with the highest correlations are retained. Such external criteria are, however, almost never available. The best available measure of the attitude is the total item pool that has been carefully constructed. By purifying this, the items will at least be consistent and homogenious--they will measure the same thing--and the scale may also be valid.

Following this correlation coefficients for each item were computed with the total score, and those with the highest correlations were retained. This method is the internal-consistency method of item-analysis, since no external criterion is available. The final scale (table 1) consists of 22 items, all carrying equal weights. The respondents were asked to indicate their degree of agreement, and these responses were subsequently scored one through five, with scoring for negative items reversed. After this, the item scores were added up to a total score, and that score was the respondent's score on the scale. Reliability of Likert scales tends to be good and, partly because of the greater range of answers permitted to respondents, is often higher than the reliability of other types of scales (Oppenheim, 1966). Using the Likert scale has two advantages. First, more precise information about the degree of agreement or disagreement among the responses is provided. Second, it becomes possible to include items whose manifest content is not obviously related to the attitude in question, so that the subtler and deeper ramifications of an attitude can be explored.

Table 1

Final Scale Followed by Part/Whole Correlations

I enjoy working out.	.34
I enjoy pursuing physical fitness.	.47
In order to realize the benefits of fitness one must belong to an organized group such as varisty sport teams.	.36
Our enviroment has an abundance of unhealthy substances, these adversely affect my health.	.32
If I had more time I would take the necessary steps to maintain better health.	.29
Good health is the most important thing in life.	.41
I enjoy learning health habits.	.29
I know how to maintain my personal health, but sometimes I do not practice what I know.	.39
I utilize preventive health measures, such as dental checkups.	.26
Alcohol is no substitution for well maintained personal health.	.35
The health conscious person has less fun in social settings.	.35
I value a healthy personality very much.	.53
I would like to spend more time working on my personal health.	.46
One's knowledge about health is an individual responsibility.	.45
Personal health should not be influenced by fads advertised in the media.	.45
Personal health is a direct reflection of how you view yourself as a person.	.33
Personal health is essentially a total wellbeing.	.45
Obtaining personal health requires making necessary sacrifices.	.53
Factors beyond an individuals control make too much of a difference in my personal health.	.49
Maintaining good health will pay off in the long run with old age benefits.	.50
I love studying about my personal health.	.40
Personal health is something that I never think about.	.66

Phase 1

Attitude Questionnaire

In developing an attitude questionnaire, Schuman and Johnson recommend that items measuring attitudes or behavior should be clearly stated so that the subject can easily differentiate between the two items and respond appropriately (Schuman and Johnson, 1976). Based on the assumption that general attitudes cause specific attitudes which in turn cause specific behaviors, Oppenheim suggests that an attitude questionnaire should consist of both general and specific items, particularly if reciprocal causality is expected (Oppenheim, 1966). Other criteria for construction of the Likert scale may be found in the works of additional authors (Dillman, 1978), (Likert, 1932), and (Oppenheim, 1966).

Item Selection

An item pool was developed after a thorough review of the literature to establish those subject matter areas commonly found in personal health courses on the college and university levels. A criterion list for editing attitude statements utilized during writing and editing the statements is listed in table 2.

In addition to these suggestions, Payne has provided a checklist of things to be considered in preparing single questions for public opinion surveys. Many of the items in his list are also applicable to the phrasing of statements for attitude scales (Payne, 1928)/

A pool of 175 items was reduced by having several health curriculum experts independently judge each item for ease of rateability and estimated variability for each item in a designated subject area. Items considered difficult to rate or unlikely to discriminate were eliminated.

Table 2

Informal Criteria for Attitude Statements

Wang (1932), Thurstone and Chave (1929), Likert (1932), Bird (1940), and Edwards and Kilpatrick (1948) have suggested various informal criteria for editing statements to be used in the construction of attitude scales. Their suggestions are summarized below:

1. Avoid statements that refer to the past rather than to the present.
2. Avoid statements that are factual or capable of being interpreted as factual.
3. Avoid statements that may be interpreted in more than one way.
4. Avoid statements that are irrelevant to the psychological object under consideration.
5. Avoid statements that are likely to be endorsed by almost everyone or by almost no one.
6. Select statements that are believed to cover the entire range of the affective scale of interest.
7. Keep the language of the statements simple, clear, and direct.
8. Statements should be short, rarely exceeding 20 words.
9. Each statement should contain only one complete thought.
10. Statements containing universals such as all, always, none, and never, often introduce ambiguity and should be avoided.
11. Words such as only, just, merely, and others of similar nature should be used with care and moderation in writing statements.
12. Wherever possible, statements should be in the form of simple sentences rather than in the form of compound or complex sentences.
13. Avoid the use of words that may not be understood by those who are to be given the completed scale.
14. Avoid the use of double negatives.

The judges consisted of members of the faculty of the health departments at Oregon State University and Harford Community College. A final sample of 100 items dealing with aspects of perceived health was generated in this manner. A potential response bias may be encountered in this process. This bias occurs when the subject becomes routinized by the response pattern and responds according to this pattern instead of the content of the statements. This bias would become apparent with the positive-negative statement form, by causing the respondent to reply uniformly even when the statements reverse polarity. Protection against response set is provided by phrasing one-half of the response items in a negative manner. This breaks up the potential monotony and chances of the subject falling into a patterned response set. All items are randomly ordered. The final 100 items used in developing the scale are located in Appendix A.

Subjects were asked to rate each statement according to the direction and intensity or degree of agreement. Direction and intensity are indicated on a questionnaire by the numbers 1-5, which correspond to the following alternatives: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

Items which represent negative attitudes toward personal health were assigned values in reverse order before responses were coded and analysis was undertaken. It should be noted that response categories of a Likert scale are assumed to be of equal intervals (Oppenheim, 1966). Individual scores were then calculated for each subject by summing the values of the responses for each of the 100 items. Total scores would ideally range from 100 to 500. Since agreement with a statement (after reverse coding of negative items) reflects a positive attitude toward

personal health, higher scores was representative of more positive attitudes than lower scores.

The data for this study was obtained from a systematic random sample of students matriculating in Personal Health classes at Oregon State University. The students taking Health 160 and 170 classes during the winter term of 1980 comprised six different sections with approximately 20 students in each section. The 55 female and 45 male students were distributed by academic grade as follows: 40 freshmen, 30 sophomores, 20 juniors, and 10 seniors. They represented most academic majors at Oregon State University with the majority in Liberal Arts and Education. The student responses reflecting attitude toward the 100 statements were used for construction of a Likert scale. Item analysis, a measure of internal consistency, was utilized to generate item-to-item correlation coefficients for each attitude statement. Appendix B contains the scores for the various items. In order to obtain an approximately equal number of positive and negative statements, the two types did not necessarily have equal correlation coefficients. A final scale was selected based upon the outcomes of this analysis.

The 22 items with the highest correlations were selected for the final scale. This final scale completed phase one of the study and required that the resultant scale be evaluated for reliability and validity to determine its effectiveness as an instrument for measurement of personal health attitudes.

To obtain the data for this process, 100 students and 50 professional health specialists repsonded to the scale. The directions for this assignment follow: "The following items are not designed to test your knowledge. Instead they are meant to explore some of your feelings

and points of view toward personal health. There are no right or wrong answers. Please give a thoughtful and honest response to each statement by circling the appropriate number beside each item. For each statement listed, choose the appropriate response which best describes how you feel. The response choices are listed below":

1 = strongly disagree
2 = disagree
3 = uncertain
4 = agree
5 = strongly agree

The population is described and the results of their responses are treated in phase two of the paper.

Phase 2

Reliability of the Scale

The reliability of the scale was assessed by the split-half correlation technique. This method entails arranging all items into two groups, such that all even-numbered items comprise one scale and all odd-numbered statements a second scale. The results of this process are contained in Appendix C. A pearson product moment correlation coefficient was computed to determine the reliability coefficients of the two groups sampled. The 100 student control group produced a split-half reliability of .66 corrected by the spearman brown to .80. The 50 professionals experimental group produced a split-half reliability of .69 corrected by the spearman brown to .82.

Validity

The validity of the scale was determined by comparing the responses of a control group with those of a known group of experts. This group consisted of professional health educators who were assumed to

have a predicable attitude toward personal health and a high level of knowledge pertaining to the various aspects of the field. The control group consisted of 100 students from various health classes at Oregon State Univerisity. Classes for use in this process were selected at random and included students from freshman to senior standing. The 50 health professionals consisted of 28 physicians, seven dentists, eight nurses, and seven professors of health all working in the Corvallis area. This group was also selected at random from institutions such as hospitals and Oregon State University.

The main consideration related to the validity of the instrument was whether it adequately measured the attitude of personal health. Thus, the basic problem of validation was "Does the instrument measure attitudes toward individual personal health?" One method of determining this was to execute a known group validation utilizing individuals who were professional health educators such as physicians, dentists, and professors of health who were assumed to have a high positive attitude toward personal health, because of the nature of their training and life work. Utilizing this method, the validity of the scores of these experts would be viewed as measuring the instrument's ability to accurately measure a true attitude toward the unidimensional concept of personal health. A perfect scale would develop a validity of 1.0 on the part of experts since it would accurately measure their attitude which was assumed to be at 100% toward the positive end of the spectrum. How close the actual validity came to this was an indication of the scale's ability to measure personal health attitude. The logic behind this type of validation was derived from the work of the Rand Corporation in development and utilization of the Delphi

technique. This work demonstrated that a group of experts' opinions and ideas about a relevant topic would converge and become similar over a period of trials demonstrating a solid and common background and set of principles (Anderson, 1975).

The validity of the scale, following the information derived from the Delphi work, shows that if the group of experts do indeed score differently than the control group, the higher scores would indicate the ability of the instrument to measure an attitude distinctly toward personal health, and not merely some unknown concept.

The following two hypotheses were evaluated utilizing a t test:

> The null hypothesis stated that there is no significant difference in levels of responses between a control group and a group of experts to the attitude scale.
>
> The positive hypothesis stated that there is a significant difference in levels of responses between a control group and a group of experts to the attitude scale.

At the .05 level of significance, a t value of 1.98 was obtained, with the 50 professionals obtaining higher means of 90 compared to the 100 students' mean score of 85. The degrees of freedom utilized for charting the t score was 148. The students had a standard deviation (SD) score of 6.57 while the SD for the professional group was 9.37. On the basis of the results of the t test, the null hypothesis can be rejected and the other retained. Because this test indicated a true significant difference between the two groups, it was assumed that the attitude scale is valid (Guilford, 1965). If the two group scores were alike, then the professional group scores could have occured through chance, but since a significant level of difference occured, the attitude scale was assumed to be a valid instrument for measuring personal health attitude.

IV SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In the present study, a Likert scale was developed to measure the attitude individuals have toward their personal health. Data was gathered by administering a 100-item questionnaire to personal health class students and then by determining the most appropriate items to retain in the final scale through part-whole correlation analysis of these results. The superior items were utilized in the final 22 item scale, which was administered to 100 health students and 50 health professionals. These results were analyzed for reliability with a .80 and .82 correlated coefficients, and a validity study was compiled. From this treatment and results, it can be stated that this scale meets the criteria for use as a tool to determine individual attitudes toward personal health. The uses of the scale are applicable to both the clinica and educational setting. In schools, the scale can be utilized in a pretest/post-test manner to determine what, if any, changes in attitude occur through treatment of students with various curriculum and teaching styles. It may also serve to determine the attitude of individuals with different backgrounds and demographics. This information would be important in planning curriculums for various students and in developing expectations for specific programs with certain groups within the population. The scale could also be used in combination with other health measurement tools to gain more complete information about an individual. In the clinic setting, the scale could serve to give the health professional information as to the expectations he has about patient recovery and remediation programs. The instrument

would aid the physician in determining certain specifics about his or her patient such as why some people work dilligently toward recovery while others complacently plod along. In this text, the scale could serve as a screening tool for patients to give data which could be utilized to channel patients into specific forms of therapy and remediation.

Conclusions

The development of the attitude scale provides a tool which can be utilized in the classroom and clinic setting. It is important to realize that the scale is a dynamic instrument, not a static one, which, once developed, shall remain true and worthy for ever. Like any worthwhile instrument, it needs to be periodically updated and revised to keep it abreast of the times and relevant to those utilizing it. These updates would take into account changes in the modes of teaching about personal health, as well as changes which naturally occur to the demographics of the individuals for whom the instrument is meant. The conclusion of this project is that the measurement of health attitudes is an ongoing project with the personal health attitude scale being an integral, but partial, element of the total picture.

Recommendations for Future Research

Several areas for additional exploration became evident during the development of the personal health attitude scale. These areas are as follows:

1. The empirical reliability and validity of the scale could be improved by critically analyzing the contents of the attitude statements in order to determine which items should be retained or eliminated on a

revised scale. In addition, a re-examination of scale items could suggest clues as to the development of new attitude statements for possible inclusion in a revised scale. Factor analysis might identify specific dimensions being measured and suggest other factors being left out, or dimensions inadequately covered.

2. Obtaining data from a larger, more representative sample would increase the confidence in the findings of this study. Ideally, a large national sample, proportionally representing all segments of the social structure, should be drawn. Also, additional studies could include other demographics about the individual (sex, race, socioeconomic factors, and psychological dimensions) which could be compared.

3. The developed scale could be utilized in research aimed at measuring effective changes brought about in a group's outlook toward their personal health. The scale would provide the base line and potential change data for this type of study. Base line information could also be used to plan and structure course content and learning experiences to increase the relevance of the personal health class in an effort to better meet student needs.

4. Of further interest would be a determination of those factors which most strongly affect the development of health attitudes. This and other related instruments could then be used to gain a more total and realistic picture of the dynamics underlying the development of personal health attitudes. Some factors which may be relevant include ethinic background, social class, religious beliefs and practices, psychological dimensions such as locus of control, and personality factors.

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APPENDICES

APPENDIX A

Item Pool

The following items are not designed to test your knowledge. Instead they are meant to explore some of your feelings and points of view toward your personal health. There are no right or wrong answers. Further, your responses will not be made known to other students nor will they be used for grading purposes in this term. Please give a thoughtful and honest response to each item, by placing the number which best represents your feelings on the answer sheet. There is no time limit but work rapidly.

The information listed below will help us classify the individuals who are involved in this exercise.

Male _____ Female _____

College class level _____ (freshman, soph, junior, senior)

College major _____

For each statement listed below choose the appropriate response which best describes how you feel. The response choices are listed below.

1 = strongly disagree 2 = disagree 3 = uncertain 4 = agree

5 = strongly agree

1. I enjoy working out.
2. My personal health would be better if I could be more relaxed.
3. I enjoy jogging.
4. My health would improve if I would set more time aside for relaxation.
5. I enjoy pursuing physical fitness.
6. In order to realize the benefits of fitness, one must belong to an organized group such as varsity sports teams.
7. I believe an individual's health would improve if one went outside and enjoyed the wonders of nature.
8. I am easily frustrated about my health.
9. I believe that I am healthy since I actively participate in sports.
10. I am easily worried about my health.
11. I require an organized program to maintain my level of health.
12. I would be healthier if workout areas were closer to my home.
13. There is not enough time in the day to do all that is necessary to maintain my health.
14. I am easily depressed about the state of my health.
15. Our environment has an abundance of unhealthy substances, those adversely affect my health.
16. American junk food is the most important contributor to poor health.
17. I would be healthier if equipment and facilities were closer to my home.
18. The important factor in maintaining good personal health is individual motivation.
19. If I had more time I would take the necessary steps to maintain better health.
20. If I was not overburdened with other responsibilities, I would take the necessary steps to maintain better health.
21. Good health is the most important thing in life.
22. I can obtain proper health by enjoying life.

23. I feel uncomfortable when I do not exercise.

24. I am responsible for my personal health.

25. Life is too short to worry about poor health.

26. I procrastinate too much when it comes to changing my poor health habits.

27. I have a hard time accepting information about my health.

28. I believe a person can enjoy life when he is healthy.

29. Drugs are no substitute for well maintained personal heath.

30. My future health concerns me.

31. Good health practices can help prevent senility in old age.

32. I have a difficult time getting information about my personal health.

33. Maintaining my health as a youngster will aid me in living to a healthy old age.

34. I enjoy learning health habits.

35. I could be healthier but I lack the interest and motivation.

36. I know how to maintain my personal health, but sometimes I do not practice what I know.

37. I spend a good deal of time each day thinking about my personal health.

38. Worrying about ones health is unhealthy.

39. Personal health is a difficult thing to achieve.

40. The medical and professional community is responsible for my health.

41. My health is the most important thing to me.

42. I utilize additives, such as vitamins, to improve my health.

43. Those who teach about personal health should be living examples of good health.

44. I utilize preventive health measures, such as dental check-ups.

45. I am easily able to maintain my health.

46. The biggest obstacle to maintaining my health is my poor mental outlook.

47. I utilize preventive health measures such as regular medical check-ups and exams.

48. Alcohol is no substitution for well maintained personal health.

49. Some individuals really overdo it when it comes to maintaining personal health.

50. There is too much self-discipline involved in the pursuit of a healthy body.

51. The health conscious person has less fun in social gatherings.

52. In our hectic times, individuals are too involved in other activities to practice good health habits.

53. Drinking alcohol takes priorities over healthful practices.

54. It would be a full time job to keep yourself as healthy as recommended.

55. Maintaining health at high levels requires too much time.

56. Maintaining personal health at high levels requires too much effort.

57. It is much too difficult to make the commitment toward working at personal health.

58. I am healthier than most individuals around me.

59. Maintaining health at high levels requires too much time.

60. I am unhealthier than most individuals around me.

61. The modern world is too complicated to be concerned with health.

62. I think that there is no excuse for being unhealthy.

63. Personal health is often a difficult thing to achieve.

64. I value a healthy personality very much.

65. Practicing good health can help me maintain my proper weight.

66. I would like to spend more time working on my personal health.

67. Your health will only be as good as the effort that you put into its improvement.

68. Personal health is essential in maintaining a productive, satisfying life.

69. My enthusiasm about improving my health seems to build and diminish in a cyclic fashion.

70. I feel that most people do not have healthful practices such as proper exercise.

71. Personal health can be maintained by occasional effort.

72. One's knowledge about health is an individual responsibility.

73. I should take the lead toward learning proper health habits.

74. Personal health should not be influenced by fads advertised in the media.

75. Personal health is the most important part of good self-concept.

76. I think that good health is the main ingredient to a successful life.

77. A sound mind and body are necessary for one to enjoy life.

78. The length and quality of life has little dependency on your daily routine.

79. Personal health is a direct reflection of how you view yourself as a person.

80. I should take the lead toward learning proper health information.

81. Personal health is essentially a totally well-being.

82. An individual should schedule one hour daily for fitness and health improvement.

83. I think that good health is the main ingredient to a productive life.

84. Good health practices lead to living a long life.

85. A measurement of an individual's commitment to good health is the amount of emphasis put into daily health activities.

86. The pursuit of good health leads to an optimistic outlook on life.

87. Obtaining personal health requires making painful sacrifices.

88. Good personal health is a lifelong pursuit.

89. Obtaining personal health requires making necessary sacrifices.

90. In our present society good overall health is difficult to achieve.

91. I do not understand what personal health is, therefore I don't know what I am missing.

92. Factors beyond an individuals control make too much of a difference in my personal health.

93. Good health is an abstract thing, most individuals are just lucky enough to be born with it.

94. Maintaining good health will pay off in the long run with old age benefits.

95. There is too much emphasis on living for the future, enjoy whatever level of health you have now.

96. My health is beyond my control.

97. I love studying about my personal health.

98. I enjoy my present level of health, no changes are necessary.

99. Pursuing health does not pay enough dividends for the time invested.

100. Personal health is something that I never think about.

APPENDIX B

Part-Whole Correlations for 100 Statements

Positive:				Negative:			
#100	.66			# 8	.39	87	.57
89	.53			9	.34	88	.35
64	.53			10	.07	90	.17
94	.50			11	.69	91	.47
92	.49			12	.02	93	.29
5	.47			13	.54	95	.10
66	.46			14	.42	96	.53
74	.45			16	.99	99	.31
72	.45			17	.36		
81	.45			20	.19		
21	.41			22	.25		
97	.40			25	.30		
36	.39			26	.26		
6	.36			27	.42		
48	.35			28	.17		
51	.35			31	.10		
1	.34			32	.36		
79	.33			35	.32		
15	.32			40	.52		
19	.29			43	.44		
34	.29			46	.45		
44	.26			47	.09		
				49	.78		
38	.26	3	.03	50	.92		
30	.22	61	.02	53	.37		
45	.21	4	.005	54	.22		
2	.21			55	.32		
84	.20			56	.009		
24	.19			57	.55		
65	.18			58	.35		
41	.16			59	.61		
98	.16			60	.13		
33	.15			63	.05		
37	.15			67	.74		
18	.14			68	.67		
42	.13			69	.89		
52	.12			71	.03		
62	.11			73	.21		
29	.09			75	.11		
86	.08			76	.91		
7	.07			77	.76		
70	.06			78	.26		
82	.04			80	.37		
39	.04			83	.07		
23	.03			85	.12		

APPENDIX C

50 Professional Inventory Scores
Reliability Data

	Total	Odd	Even		Total	Odd	Even
1	94	46	48	41	91	46	45
2	95	47	48	42	77	39	38
3	107	53	54	43	100	51	49
4	94	47	47	44	84	42	42
5	93	47	46	45	54	27	27
6	78	39	39	46	84	42	42
7	93	46	47	47	90	44	46
8	107	54	53	48	88	44	44
9	87	39	48	49	72	36	36
10	99	49	50	50	86	43	43
11	77	39	38				
12	86	43	43				
13	88	43	45				
14	82	41	41				
15	99	52	47				
16	92	46	46				
17	90	42	48				
18	90	45	45				
19	86	45	41				
20	93	47	46				
21	99	51	48				
22	92	46	46				
23	96	41	55				
24	76	38	38				
25	90	44	46				
26	96	48	48				
27	76	33	43				
28	90	45	45				
29	92	46	46				
30	99	50	49				
31	92	43	49				
32	93	47	46				
33	86	44	42				
34	87	43	44				
35	72	41	31				
36	91	46	45				
37	82	42	40				
38	89	45	44				
39	90	46	44				
40	100	50	50				

Odd Score Total = 2218

Even Score Total = 2231

Total = 4449

Reliability Data of 50 Professionals con't

	X_1^2	X_2^2	$X_1 \times X_2$		X_1^2	X_2^2	$X_1 \times X_2$
1	2116	2304	2208	37	1764	1600	1680
2	2209	2305	2256	38	2025	1936	1980
3	2809	2916	2862	39	2116	1936	2024
4	2209	2209	2209	40	2500	2500	2500
5	2209	2116	2162	41	2116	2025	2070
6	1521	1521	1521	42	1521	1444	1482
7	2116	2209	2162	43	2601	2401	2499
8	2916	2809	2862	44	1764	1764	1764
9	1521	2304	1872	45	729	729	729
10	2401	2500	2450	46	1764	1764	1764
11	1521	1444	1482	47	1936	2116	2024
12	1849	1849	1849	48	1936	1936	1936
13	1849	2025	1935	49	1296	1296	1296
14	1681	1681	1681	50	1849	1849	1849
15	2704	2209	2444				
16	2116	2116	2116				
17	1764	2304	2016				
18	2025	2025	2025				
19	1015	1681	1845				
20	2209	2116	2162				
21	2601	2304	2448	Totals	99139	100821	99667
22	2116	2116	2116				
23	1681	3025	2255				
24	1444	1444	1444				
25	1936	2116	2024		"r" = .69		
26	2304	2304	2304				
27	1089	1849	1419				
28	2015	2025	2025				
29	2116	2116	2116				
30	2500	2401	2450				
31	1849	2401	2450				
32	2209	2116	2162				
33	1936	1764	1848				
34	1849	1936	1982				
35	1681	961	1271				
36	2116	2025	2070				

100 Student Inventory Scores Reliability Data

	T	O	E		T	O	E		T	O	E
1	88	42	46	35	83	41	42	69	95	48	47
2	88	44	44	36	90	45	45	70	82	40	42
3	91	45	46	37	79	40	39	71	93	46	47
4	88	44	44	38	89	43	46	72	93	45	48
5	94	47	47	39	89	45	44	73	89	45	44
6	84	42	42	40	75	36	39	74	90	42	48
7	83	43	40	41	89	44	45	75	77	39	38
8	93	46	47	42	86	42	44	76	99	50	49
9	93	46	47	43	90	45	45	77	95	47	48
10	89	44	45	44	83	41	42	78	81	44	37
11	79	40	39	45	77	39	38	79	92	46	46
12	85	42	43	46	92	45	47	80	95	47	48
13	83	42	41	47	95	47	48	81	82	41	41
14	95	47	48	48	95	47	48	82	77	40	37
15	77	37	40	49	98	49	49	83	83	40	41
16	91	45	46	50	82	38	44	84	97	48	49
17	95	46	49	51	77	39	38	85	84	42	42
18	90	45	45	52	89	44	45	86	79	43	36
19	83	41	42	53	81	40	41	87	86	43	43
20	75	38	37	54	76	40	36	88	82	41	41
21	80	40	40	55	77	39	38	89	78	39	39
22	82	42	40	56	84	43	41	90	90	45	45
23	86	43	43	57	86	43	43	91	79	40	39
24	84	42	42	58	88	45	43	92	89	45	44
25	85	42	43	59	97	48	49	93	90	45	45
26	93	44	49	60	85	40	45	94	97	49	48
27	94	47	47	61	80	40	40	95	85	43	42
28	81	40	41	62	95	49	46	96	89	45	44
29	99	50	49	63	89	44	45	97	87	43	44
30	89	44	45	64	89	43	46	98	85	44	41
31	74	37	37	65	83	42	41	99	89	45	44
32	77	39	38	66	75	39	36	100	80	40	40
33	83	41	42	67	81	47	44				
34	98	46	53	68	85	42	43				

Sum Odd = 4321

Sum Even = 4339

Reliability Data of 100 Students con't

	$X_1 \times X_2$		$X_1 \times X_2$		$X_1 \times X_2$
1	1932	35	1722	69	2256
2	1936	36	2025	70	1680
3	2070	37	1560	71	2162
4	1936	38	1978	72	2160
5	2209	39	1980	73	1980
6	1764	40	1404	74	2016
7	1720	41	1980	75	1482
8	2162	42	1848	76	2450
9	1968	43	2025	77	2256
10	1980	44	1722	78	1628
11	1560	45	1482	79	2116
12	1806	46	2115	80	2256
13	1722	47	2256	81	1681
14	2256	48	2256	82	1480
15	1480	49	2401	83	1722
16	2070	50	1672	84	2352
17	2254	51	1482	85	1764
18	2025	52	1980	86	1548
19	1722	53	1640	87	1849
20	1406	54	1440	88	1681
21	1600	55	1482	89	1521
22	1680	56	1763	90	2025
23	1849	57	1849	91	1560
24	1764	58	1935	92	1980
25	1806	59	2352	93	2025
26	2156	60	1800	94	2352
27	2209	61	2254	95	1806
28	1640	62	2254	96	1980
29	2450	63	1980	97	1882
30	1980	64	1978	98	1804
31	1369	65	1722	99	1980
32	1482	66	1404	100	1600
33	1722	67	2068		
34	2438	68	1806		

Sum of the above = 188128

Reliability Data of 100 Students con't

	$(X_1)^2$	$(X_2)^2$		$(X_1)^2$	$(X_2)^2$		$(X_1)^2$	$(X_2)^2$
1	1764	2116	35	1681	1764	69	2304	2209
2	1936	1936	36	2025	2025	70	1600	1764
3	2025	2116	37	1600	1521	71	2116	2209
4	1936	1936	38	1849	2116	72	2025	2304
5	2208	2209	39	2015	1936	73	2015	1936
6	1764	1764	40	1296	1521	74	1764	2304
7	1849	1600	41	1936	2025	75	1521	1444
8	2116	2209	42	1764	1936	76	2500	2401
9	2304	1681	43	2025	2025	77	2209	2304
10	1936	2025	44	1681	1764	78	1936	1369
11	1600	1521	45	1521	1444	79	2116	2116
12	1764	1849	46	2025	2209	80	2209	2304
13	1764	1681	47	2209	2304	81	1681	1681
14	2209	2304	48	2209	2304	82	1600	1369
15	1369	1600	49	2401	2401	83	1764	1681
16	2025	2116	50	1444	1936	84	2304	2401
17	2116	2401	51	1521	1444	85	1764	1764
18	2025	2025	52	1936	2025	86	1849	1296
19	1681	1764	53	1600	1681	87	1849	1849
20	1444	1369	54	1600	1296	88	1681	1681
21	1600	1600	55	1521	1444	89	1521	1521
22	1764	1700	56	1849	1681	90	2015	2025
23	1849	1849	57	1849	1849	91	1600	1521
24	1764	1764	58	2025	1849	92	2025	1936
25	1764	1849	59	2304	2401	93	2025	2025
26	1936	2401	60	1600	2025	94	2401	2304
27	2209	2209	61	1600	1600	95	1849	1764
28	1600	1681	62	2401	2116	96	2025	1936
29	2500	2401	63	1936	2025	97	1849	1936
30	1936	2025	64	1849	2116	98	1936	1681
31	1369	1369	65	1764	1681	99	2015	1936
32	1521	1444	66	1521	1296	100	1600	1600
33	1681	1764	67	2209	1936			
34	2116	2809	68	1764	1849			