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Development of an Instrument to Measure the Health Beliefs of Individuals with Arthritis

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DEVELOPMENT OF AN INSTRUMENT TO MEASURE THE HEALTH BELIEFS OF INDIVIDUALS WITH ARTHRITIS

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VITA

The author, Susan Lynn Dean-Baar, is the daughter of Bernard G. Dean and the late Dian C. (Bell) Dean. She was born April 5, 1956 in Chicago, Illinois.

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Ms. Dean-Baar has served in a leadership capacity in several national nursing organizations including Chairman of the Rehabilitation Nursing Foundation and Co-chairperson of the American Nurses Association Committee on Nursing Practice Standards and Guidelines. She has been an author, presenter, and consultant in rehabilitation nursing and in nursing practice standards and guidelines.

To My Mother

Dian Constance Dean

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CHAPTER I

INTRODUCTION

The incidence of individuals with a chronic illness is increasing as the life span lengthens and advances in health care technology continue. One of the goals of treatment for individuals with a chronic illness is to engage in health behaviors that are directed at management of their chronic disease. Education is one factor which aids in accomplishing this. However, education alone will not insure that an individual will engage in these recommended health behaviors (Falvo, 1985). One of the factors that is believed to influence the use of knowledge is health beliefs (Sackett & Haynes, 1976; Becker & Janz, 1985).

The purpose of this study is to develop an instrument that will identify and measure the health beliefs of individuals with arthritis. The development of an instrument that facilitates reliable and valid measurement of health beliefs of individuals with arthritis will allow further investigation of the relationship between health beliefs and use of knowledge in engaging in health behaviors directed at daily management of the arthritis disease process.

Arthritis was the second most prevalent chronic condition reported by the National Health Interview Survey during 1983-85 (Unites States Department of Health and Human Services, 1988). The annual prevalence was estimated at 30.3 million. In the age groups of 45-64 years, 65-74 years, and 75 years and over arthritis was the chronic condition most frequently reported. However less than 10% reported ever being hospitalized for their arthritis. Several other common chronic conditions such as asthma, diabetes, and heart disease are

less prevalent but have much higher incidences of hospitalization. This indicates that much of the management of arthritis occurs outside a hospital setting.

Optimal management of chronic conditions such as arthritis requires a partnership between the individual with arthritis and health care providers. This partnership allows the health care provider to make specific recommendations regarding medication, treatments, and activities that will help to minimize the progression of the disease and best control any symptoms that may be present. The individual with the chronic condition then has the information from which to make presumedly informed decisions about which of these recommendations they will follow.

Arthritis rarely results in a life threatening state but frequently causes limitations in some area of daily living. There are over one hundred types of arthritis (Fries, 1986). In general they all have the common symptom of joint pain. This study focuses on rheumatoid and osteoarthritis. Rheumatoid arthritis presents with swelling and pain in one or more joints. This swelling and pain can led to severe joint deformity. The pain and deformity can result in problems in normal daily activities. Rheumatoid arthritis generally appears when an individual is in their forties or fifties and is seen more frequently in women. Osteoarthritis is seen in almost all individuals as they age. The joints that are most commonly affected are those involved with weight bearing (knees and hips).

Many activities and exercises can be used to manage the symptoms of arthritis and decrease the impact on the ability to engage in many normal daily activities. Lorig and Fries (1986) have written The Arthritis Handbook, which is recommended by the Arthritis Foundation for use in its classes for persons with

arthritis. This book is in its second edition and is estimated to have been used by more than 20,000 individuals with arthritis. The book was developed to give details about a variety of self-management techniques that could be used. It discusses various types of exercises to keep joints mobile to decrease stiffness and pain, pain management techniques to be used as an adjunct to medications and other treatments, adaptive ways to do daily activities such as dressing, and the various drugs that are frequently used in managing arthritis.

Arthritis has been recognized as a group of diseases that can be most successfully managed through use of recommended self-management techniques and modifications in life-style in addition to medical treatment and medication. Arthritis like other chronic conditions, continues to frustrate health care providers because of the lack of adherence to these recommendations. Adherence can be defined as the degree to which the client follows the recommendations given by the health professional (Falvo, 1985). Nonadherence has been estimated at between 30% and 80% of clients in study populations (Marston, 1970; Becker & Green, 1975; Sackett & Haynes, 1976). The likelihood of adherence to recommended actions is influenced by many factors including the complexity, duration, and amount of change involved in a regimen; inconveniences; level of satisfaction; and health beliefs (Becker & Rosenstock, 1984).

The Health Belief Model has been used as a conceptual framework for studies that propose to identify and clarify other factors involved in patient compliance to a suggested regimen for health problem management (Algona, 1980; Andreoli, 1981; Cerkoney & Hart, 1980; DeVon & Powers, 1984; Fincham & Wertheimer, 1985; Given, Given, & Coyle, 1984; Harris & Linn, 1985; and Nagy & Wolfe, 1984). This model proposes that individuals will seek out health

care and follow any recommended advice about their health. This model was first developed in the 1950's in an attempt to explain why individuals did not participate in screening and preventative programs related to asymptomatic diseases. The model was later used as a framework to evaluate patient's response to symptoms (Kirscht, 1974) and to analyze compliance with prescribed medical regimens (Becker, 1974).

Rosenstock (1960) traces the basis for the Health Belief Model to the development of research in the area of motivation and to Lewinian field theory (Lewin, 1951). These two areas combined result in three basic principles of motivation that are proposed to account for health behaviors. The three principles are:

> Principle I - Preventive or therapeutic behavior relative to a given health problem in the individual is determined by the extent to which he sees the problem as having both serious consequences and a high probability of occurrence in his case and the extent to which he believes that some course of action open to him will be effective in reducing threat.
> Principle II - Behavior emerges out of frequent conflict among motives and among course of action.
> Principle III - Health-related motives may not always give rise to health related behavior, and conversely health-related behavior may not always be determined by health-related motives. (p.299)

It was hypothesized that behavior depends on two variables: "(1) the value placed by an individual on a particular outcome and (2) the individual's estimate of the likelihood that a given action will result in that outcome" (Maiman & Becker, 1974, p.9).

The basic elements of the Health Belief Model are indicated in Figure 1. There are five major dimensions of the Health Belief Model. The first is perceived susceptibility. Perceived susceptibility refers to an individual's subjective perception of the risk or vulnerability to a specific disease or

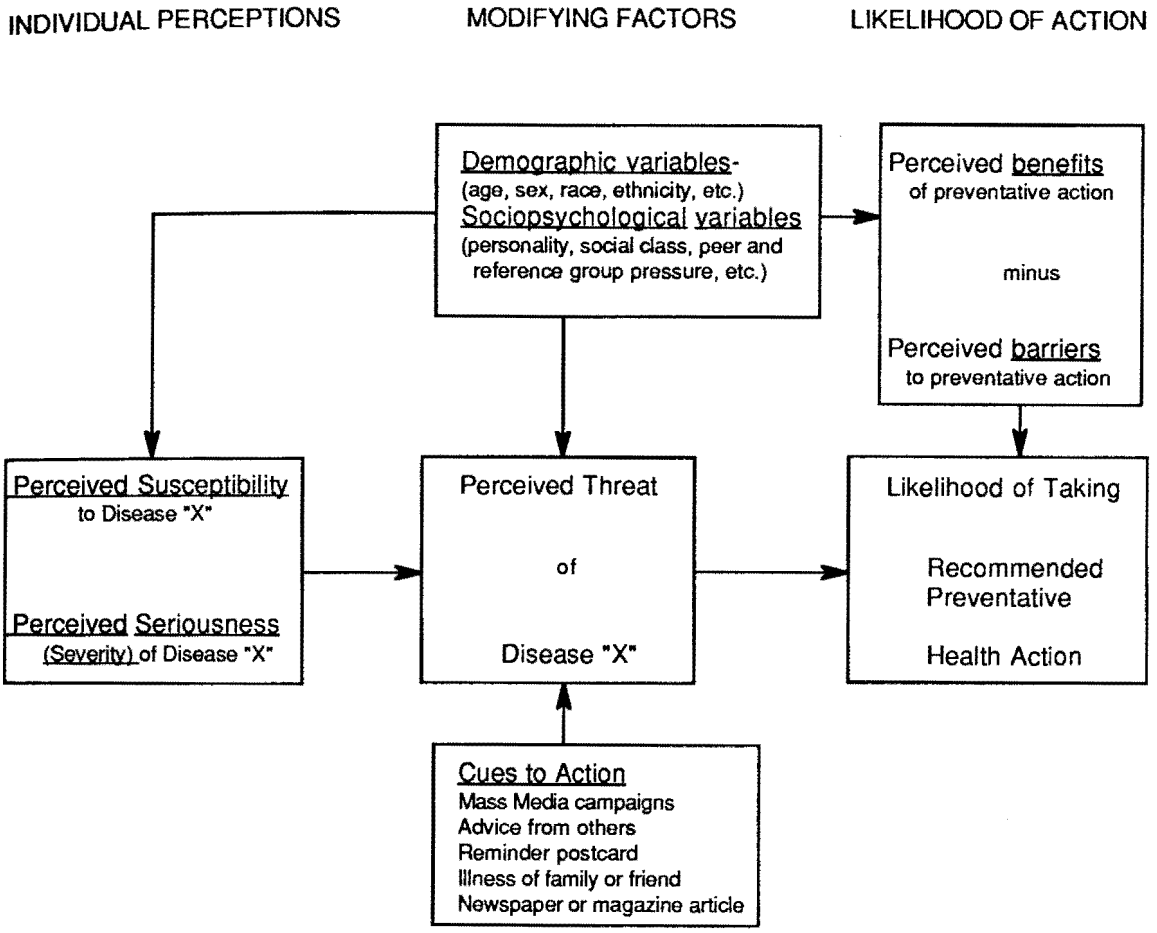

Figure 1. Elements of the Health Belief Model, adapted from Janz, N. K. and Becker, M. H. (1984).

condition. When a medical diagnosis has been made it also includes the following: the individual's belief in the accuracy of the diagnosis, the perceived likelihood of reoccurrence, and susceptibility to illness in general.

The second dimension is perceived severity. This dimension refers to an individual's perception of the medical and/or social consequences of contracting a disease or of not treating a disease already present.

The third dimension is perceived benefits. This dimension includes an individual's beliefs about the likelihood that possible actions available to him/her will lead to effective treatment or prevention of the disease. This also includes an evaluation by the individual of the feasibility of the course(s) of action available.

The fourth dimension is perceived barriers. Barriers are the potential negative aspects of a recommended course of action. These may include cost, amount of time required, how convenient or inconvenient the course of action is, side effects of the action, and degree of unpleasantness (painful, upsetting, difficult, etc.). It is important to remember that in each of these dimensions it is the individual's subjective perception that is important and not the health care provider's perception of each of these dimensions.

The fifth dimension is cues to action. These include both internal and external factors and events that trigger an individual to engage in health behaviors. Examples may include awareness of symptoms (such as pain), written reminders from health care providers, or the illness of a family member or friend.

The Health Belief Model proposes that the likelihood that an individual will take action related to a health condition is determined by the individual's psychological state of readiness and the weight of the perceived benefit against

the perceived barriers or cost of taking the action. The psychological state of readiness is the subjective perception determined by both the perceived susceptibility to the disease and the perceived severity of the disease (Rosenstock, 1966, 1974). The health behavior or action is triggered by an internal or external cue.

In addition to these dimensions the Health Belief Model includes a group of modifying or enabling factors such as demographic variables, structural variable (e.g., complexity of the medical regimen), attitudinal variables (e.g., satisfaction with health care), and sources of advice or social pressure. These modifying or enabling factors influence the individual's perception of susceptibility, severity, and benefits of taking action.

In order to use the Health Belief Model to look at sick role behavior, including patient adherence to prescribed medical regimens, several modifications to the model as it was originally proposed have evolved. The dimensions of perceived susceptibility or vulnerability were modified to perceived resusceptibility when using the Health Belief Model to explain health behaviors in individuals who have already been diagnosed with a disease (Becker, 1974). General health motivation was also added as a dimension (Becker, 1974).

Janz and Becker (1984) reviewed forty-six studies using the Health Belief Model. They found that the results of the studies provided substantial support for the dimensions of the Health Belief Model. Champion (1984), Given, et al. (1983,1984, 1985) and other have used and developed instruments designed to measure health beliefs. Jette et al. (1981), as a result of their research, have suggested that health belief instruments be designed to be population specific in order to strengthen the reliability and validity.

Development of instruments to measure the various dimensions of the Health Belief Model has varied considerably as discussed in Chapter II. Instruments to measure dimensions of the Health Belief Model need to be designed so that they provide meaningful information. Each of the dimensions of the Health Belief Model can be considered an attribute with variability. Measurement provides for meaningful interpretation of the nature of an attribute (Waltz, Strickland, and Lenz, 1984).

Reliability and validity measures are aimed at minimizing the portion of an observed score that is due to random and systematic error and maximizing the portion that is true. Research that uses instruments to measure attributes need to report data regarding the instruments validity and reliability to aid in interpretation of the research results. In particular the lower the reliability coefficients the lower the confidence that can be placed in any judgement or evaluation that is made about relationships being investigated in a particular study. Conversely, the higher the reliability coefficients the higher the confidence that can be placed in any judgments that are made by the investigators.

Reliability is the first characteristic that an instrument should possess. Reliability refers to the consistency or repeatability of a measurement made with an instrument. Reliability can be defined as "the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials" (Carmines and Zeller, 1979, p.11).

Reliability assessment can be estimated in several ways. Test-retest reliability is the correlation between scores from the same subjects taken at two different times. Reliability also can be estimated by use of intrarater reliability in which the consistency with which one rater assigns the same score to different

observation of the same event is evaluated. Interrater reliability is estimated by evaluating the consistency with which more than one rater scores the same event. Another form of reliability is parallel form reliability in which two different tests that measure the same trait in the same way are developed. The reliability coefficient in this form of reliability measurement is the correlation of the same subjects scores on the two parallel forms of the test. Internal consistency reliability is based on the assumption that several items relevant to the studied trait produce a composite score that is closer to the subject's true errorless score than any one item would be (Jacobson, 1988).

Reliability is a matter of degree and is reported in coefficients between -1.00 and +1.00. Reliability coefficients are not generalizable and should be recalculated each time an instrument is used. The closer the correlation coefficient is to +1.00 the more reliable the instrument is thought to be. Reliability coefficients of .60 to .70 may be acceptable for the exploratory use of instruments or for instruments that are in the early stages of development (Nunnally, 1967).

Validity is the second characteristic that an instrument should possess. Validity can be defined as "the extent to which a measure achieves the purposes for which it was intended" (Waltz, Strickland, & Lenz, 1984, p. 141). Validity is dependent on reliability. An instrument needs to measure something consistently before its ability to measure what it claims to measure can be evaluated. Thus an instrument can be reliable but not valid but cannot be valid and not reliable.

As with reliability there are several forms of validity. The weakest form of validity is face validity. Face validity is a judgement by an individual that the tool appears to measure what it is purported to measure. Content validity refers

to whether or not items included in an instrument adequately sample the content area. Content validity can be estimated by submitting items to a panel of experts in the content area. Judgements about content validity can be made by calculating the percent agreement among the judges.

Criterion-related validity is the correlation between a measure and another indicator believed to measure the same phenomenon. There are two types of criterion-related validity: predictive validity and concurrent validity. "Predictive validity indicates the extent to which an individual's future level of performance on the criterion can be predicted from knowledge of performance on a prior measure. Concurrent validity refers to the extent to which a measure may be used to estimate an individual's present standing on the criterion" (Waltz, Strickland, & Lenz, 1984, p. 149).

Construct validity is "concerned with the extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concepts (or constructs) that are being measured" (Carmines and Zeller, 1979, p. 23). Construct validity is most directly concerned with what an instrument actually measures. It is especially useful for measures of affect and other abstract concepts for which criterion-related validity is unsuitable (Jacobsen, 1988). There are several approaches to construct validity. In the known groups (or contrasted groups) approach the instrument is administered to two groups - one known to be high in the concept being measured and one that is known to be low in the concept being measured. If the scores between the two groups differ significantly than construct validity is supported. Another approach to construct validity is experimental manipulation in which hypotheses about the behavior of people

with varying scores on the measures is tested. If the predictions are supported then construct validity is supported.

Two correlational approaches to construct validity also exist. In the multitrait-multimethod approach a minimum of two constructs are measured in at least two different ways. The scores are entered into a correlation matrix that then provides correlations for convergent, construct, and discriminant validity. Convergent validity refers to the idea that different measures of the same trait should correlate highly while discriminate validity refers to the idea that measures of different constructs should have low intercorrelations. Construct validity is supported if there is a high degree of convergent and discriminant validity. The other correlational approach is factor analysis. In factor analysis clusters (or factors) of related items are identified. The factors can then be used to name or confirm prior theorizing about a construct.

Instruments that are developed to measure the dimensions of the Health Belief Model need to include estimates of their reliability and validity. Although instruments to measure some or all of the dimensions of the Health Belief Model have been developed with varying degrees of validity and reliability for chronic cardiac conditions and for diabetes, none of these instruments would be suitable for the population of individuals with arthritis. In order to continue to develop the usefulness of the Health Belief Model in understanding health behaviors in patients with chronic illnesses, it is necessary to develop instruments that will measure the health beliefs of specific populations such as arthritis.

CHAPTER II

REVIEW OF LITERATURE

Purpose

A great deal of research has been done that has utilized parts or all of the dimensions of the Health Belief Model. An analysis of the research using the Health Belief Model shows that in many of the studies, investigator developed instruments were used to measure the dimensions of the Health Belief Model.

A review of the research shows that the process used to develop these instruments being used to measure dimensions of the Health Belief Model is not described. In addition many of these instruments are used with no information reported regarding methods used to evaluate any type of reliability or validity for the instrument. Lack of these data can only be interpreted as having not occurred. Therefore many of the results of these studies need to be used cautiously because of this significant threat to the internal validity of these studies.

The purpose of this review is to demonstrate the general lack of reliability and validity estimates for most of the research that operationalizes dimensions of the Health Belief Model as variables within the study. In addition those studies that have included some estimates of reliability or validity are described.

Literature

This review will focus on research that has been conducted that used or developed instruments specifically to measure dimensions from the Health Belief Model. Other research has been done that uses the Health Belief Model

as a component of the study's conceptual framework but has not operationalized or measured the dimensions within the model. That research is excluded from this review since the focus of this research is on development of an instrument to measure the dimensions of the Health Belief Model in individuals with arthritis.

Becker, Radius, Rosenstock, Drachman, Schuberth, and Teets (1978) used the Health Belief Model as the framework to study compliance in patients with asthma. They report significant associations between general health motivation, susceptibility, severity, benefits and barriers and the level of compliance. The dimensions of the Health Belief Model were measured using a structured interview format with "most questions designed to provide measures of the Health Belief Models dimensions" (p. 269). No information on development of the questions included in the interview or on data related to reliability or validity was reported.

Harris and Linn (1985), as part of a larger study, investigated whether health beliefs were associated with compliance and whether health beliefs were associated with metabolic control in ninety-three men with adult-onset diabetes mellitus. Health beliefs were measured using the forty item Diabetes Health Belief Scale. The scale is described as having seven subscales: general health motivation, treatment beneficial, severity, susceptibility, psychologic barriers, cues to action, and structural elements. A score for each of the subscales can be obtained as well as a composite score. No information regarding reliability or validity is reported.

Their results indicated that health beliefs about severity, susceptibility, and psychological barriers were significantly related to compliance. Results from a regression analysis found that there was even a stronger relationship

between health beliefs and metabolic control. These investigators found that the best predictors of metabolic control were beliefs that the treatment is beneficial, cues to action, lack of susceptibility to complications, and that family and environmental supports are present.

Pederson, Wanklin, and Baskerville (1984) studied the compliance of 265 patients who were advised to quit smoking because of newly diagnosed pulmonary disease. Information about four aspects of health beliefs (perceived severity, noxiousness, probability, and efficacy) was collected as part of a mailed questionnaire. No information on the reliability or validity of any part of the questionnaire was provided.

When each of the four health beliefs measured was analyzed individually, no significant relationship with compliance was found. However, a logistic regression analysis found that the four health beliefs (perceived severity, probability, efficacy, and noxiousness), when taken together, are statistically significant in predicting smoking cessation three to six months later.

Smith, Ley, Seale and Shaw (1987) investigated the relationship between parents' Health Beliefs, satisfaction, and compliance in 174 children with asthma. Items to measure Health Belief Model dimensions of vulnerability, seriousness, efficacy, costs and barriers were developed. Concurrent and future compliance was evaluated by collecting data at both an initial clinic visit and a follow-up clinic visit. Slightly different items were used for the two data collection periods.

The investigators reported significant correlations between concurrent measures of Health Belief Model variables and compliance, however measures of Health Belief Model variables did not predict future compliance. In addition

they reported that satisfaction measures correlated with both concurrent measures of compliance as well as future compliance.

Each of the four dimensions of the Health Belief Model included in this study was represented by only one item. The four items combined were used to develop a scale for the Health Belief Model. Although the investigators described the four items used to measure the Health Belief Model variables they did not include any information on reliability or validity of the measures or of the scale developed from the measures that the investigators report using. The findings reported by the investigators need to be used cautiously due to the small number of items in the scale and lack of reported information regarding any form of reliability or validity.

McCallum, Wiebe, and Keith (1988) conducted a study to determine the effects of prior compliance experience and attitudes toward general health and tuberculosis on intentions to comply with a tuberculosis regimen among 256 undergraduate psychology students who were asked to imagine they had just been diagnosed with tuberculosis. In addition to information relevant to the Health Belief Model data was collected assessing Health Locus of Control, knowledge of tuberculosis, prior experience with medications regimens, and intentions to comply.

All six dimensions of the Health Belief Model were included in this study. The cues to action dimension was measured with eight yes/no questions. The dimensions of general health motivation, perceived severity, and perceived barriers to complying were measured by five items each. The dimension of perceived benefits of complying was measured with four items and perceived susceptibility was measured with two items. The specific items were not

reported. No other information was reported regarding the development of the items or about their validity or reliability.

The investigators found that with subjects with previous medication experience compliance was predicted by Health Belief Model dimensions benefits of action and cues to action. In addition internal locus of control and chance locus of control variables predicted compliance. In subjects with no previous medication experience only perceived barriers to action was related to compliance. Because of the use of a sample that was asked to imagine that they had just been diagnosed with tuberculosis and the lack of data reported regarding the validity and reliability of the measures used for the Health Belief Model dimensions caution must be exercised in using the results of the study.

Nagy and Wolfe (1984) investigated the relationship between variables derived from the Health Belief Model and the health locus of control construct with compliance to a medical regimen in individuals with chronic diseases. Their study included forty-nine hypertensive patients, fifty-two adult-onset diabetes mellitus patients, and forty-eight patients with chronic respiratory disease. Health beliefs were measured in a structured interview. Questions used to assess various beliefs are reported. Those beliefs for which more than one question was used were reported by correlations between the questions. These correlations ranged from .37 to .70 with an average of .51. No other reliability or validity data are reported. These investigators found patient satisfaction to be a significant predictor of medication compliance, and that lack of symptoms was most strongly associated with self-management compliance.

The Standardized Compliance Questionnaire (SCQ) developed by Sackett and Haynes in 1973 has been used as a measure of health beliefs in compliance studies. The literature reports minimal information regarding its

psychometric properties. Sackett (1987) states the questionnaire "is now quite out of date and do not any longer recommend its use." The SCQ has also been modified or only partially used in several reports of research. Studies which used part or all of the SCQ are reviewed here.

Alogna (1980) studied compliant and noncompliant insulin dependent diabetics and found that the compliant group perceived their illness as significantly more severe than the noncompliant group. This study did not look at any other dimension of the Health Belief Model. The perception of severity of disease index from Sackett and Haynes' Standardized Compliance Questionnaire was used. No data on reliability or validity were reported.

Cerkoney and Hart (1980) used the Health Belief Model to look at compliance in diabetes mellitus. Fifteen statements adapted from the Standardized Compliance Questionnaire were used to measure health beliefs. Each of the five original dimensions of the Health Belief Model (perceived susceptibility, perceived severity, perceptions of benefits, barriers, and cues) were measured by three items. A reliability of 88.6% on a test-retest one week apart by twenty-two diabetic individuals was reported. No other reliability or validity data were reported.

These investigators found that subjects who perceived their illness as serious and who responded to cues tended to be more compliant than those subjects who did not. A significant relationship was found between the total compliance score and the total HBM (Health Belief Model) score. When individual compliance measures were correlated with individual dimensions of the Health Belief Model significance was only found in the following relationships: insulin administration and cues, insulin reactions and susceptibility, and foot care and severity. A significant relationship was also

noted between the total compliance score and cues, total compliance score and severity, and insulin administration and total HBM score.

DeVon and Powers (1984) investigated the relationship of health beliefs and adjustment to illness in thirty patients with hypertension. Fifteen patients were classified as having their hypertension uncontrolled. No significant differences were found in health beliefs affecting compliance between the two groups of hypertensive patients.

Health beliefs were measured using the Standardized Compliance Questionnaire. They report that content validity is supported since the authors of the instrument are actively involved in research related to health beliefs. They also report Andreoli's (1981) test-retest reliability coefficient of .70. No other reliability or validity information is reported.

Andreoli (1981) studied the health beliefs and self-concept of seventy-one male patients with hypertension to determine whether there was a relationship between these two factors and the likelihood that the patient would comply with a prescribed therapy. Each patient was categorized as either a complier (n=41) or a noncomplier (n=30) using predetermined criteria for inclusion into one or the other group. The results found no significant differences in the mean scores of the measures of self-concept and health beliefs in the compliers and noncompliers.

In Andreoli's study, health beliefs were measured by the Health Belief Questionnaire. The Health Belief Questionnaire was developed by the author using the Standardized Compliance Questionnaire, the investigator's clinical experience, a review of the literature, and interviews with nurses and physicians who cared for patients with hypertension. A test-retest reliability using seven patients with hypertension was reported. The total health beliefs coefficient of

correlation was .70. The coefficients for the categories of health beliefs were susceptibility .59, severity .71, and benefits .66.

Cronin (1986) used the Health Belief Questionnaire developed by Andreoli in a study to determine if there were differences in the health beliefs of hypertensive clients who comply with prescribed therapy and those who do not. In this study the Cronbach's alphas calculated for the three scales (resusceptibility, severity, and benefits) were .58, .56, and .53. Mean scores on the three scales for the compliant and noncompliant groups were not statistically significant (p=.05) indicating no relationship between health beliefs and compliance.

Holm, Fink, Christman, Reitz, and Ashley (1985) studied the health beliefs of forty-one individuals who had sustained a myocardial infarction or underwent coronary artery bypass graft surgery, and who had completed a phase II outpatient cardiac exercise program. The beliefs examined included general health motivation, severity, resusceptibility, efficacy, barriers and cues. The modifying variables examined included sociodemographic factors, structural factors (distance to exercise program and convenience of program times), health locus of control, patient satisfaction with the program and staff, social support, and self-motivation. Health beliefs were measured using the Standardized Compliance Questionnaire. The authors address content validity by stating that DeVon and Powers (1984) report that content validity is supported due to the extensive research that Sackett and Haynes have done in this area. Reliability is reported based on Andreoli's (1981) finding of a test-retest reliability of .70 on a modified version of the Standardized Compliance Questionnaire. No reliability or validity data gathered on the sample used in this study were reported.

Data showed that most of the sample who believed in the effectiveness of the exercise program were motivated, satisfied with the program and staff, had social support from someone close, and had an external health locus of control. Subjects were generally compliant based on their responses to the various health beliefs. Significant correlations were found between perceptions of severity of illness and general health motivation; perceptions of severity of illness and resusceptibility; cues to taking health-related action and satisfaction with program staff, and program and staff satisfaction.

Tirrell and Hart (1980) studied thirty patients who had undergone coronary artery bypass surgery and had completed the postoperative exercise teaching program provided for all patients having their surgery at that institution. The study investigated the effect of the teaching program on long-term compliance with the exercise program.

Four compliance scores, two knowledge scores, and six health belief scores were calculated (five separate dimensions and a composite). The health beliefs were measured using nineteen questions modified from the Standardized Compliance Questionnaire to reflect coronary artery bypass patients. No reliability or validity data are reported.

These investigators found a statistically significant but not clinically significant correlation between 'heart walk' knowledge and 'heart walk' compliance. The correlations between individual health belief variables, 'heart walk' and compliance scores resulted in three statistically significant results. Significant relationships were found between beliefs about perceived barriers and walking compliance, beliefs about perceived barriers and 'heart walk' compliance and perceived susceptibility and 'heart walk' compliance.

The investigators noticed an inverse relationship in several unanticipated areas. They found that those who perceived themselves as most susceptible were the least compliant and those who worried less about their health (general health motivation) were most compliant. The structure of the questions, and resulting misinterpretation, on the health belief instrument are thought to account for a portion of these unanticipated relationships.

In addition to research that used some form of the Standardized Compliance Questionnaire many researchers have developed instruments to use in their study. As with the previously reviewed research the information reported on the reliability and validity of these author developed instruments is minimal in many cases. Research using author developed instruments that report some information on reliability and/or validity are reviewed next.

Given, Given, and Coyle (1984) investigated the impact of a problem-solving protocol on hypertensive individuals beliefs about their disease, efficacy of medications and diet, and on blood pressure and weight. The problem-solving protocol involved the sixty-two subjects in the experimental group working individually with specially prepared nurses to identify behavioral deficits, establish expectations, and relate those expectations to the desired psychosocial and clinical outcomes in three areas (taking of medications, following dietary restrictions, and implementing a regimen of exercise). This occurred in eight sessions over six months.

Factor analysis was used to develop five scales to measure patients' beliefs. Testing of the measures was completed on a sample of 256 hypertension patients and cross validated on an independent sample of 96 patients. Alpha coefficients of .75 or greater were reported for four scales (severity of disease, efficacy of treatment, commitment to taking medications,

and commitment to following a diet) and .82 for the scale on symptom severity. No other reliability or validity data were reported, although the authors state that "instruments with satisfactory psychometric properties were developed" (p. 134).

Multivariate analysis of the problem-solving intervention on the beliefs, psychosocial health states, and symptom severity demonstrated no significance. Univariate analysis of variance demonstrated significance in belief in severity of hypertension (0.042), commitment to taking medications (0.014), and beliefs in efficacy of therapy (0.008). Results of correlational analysis of change scores were weak and demonstrated no clear indications of which patients were more likely to respond to the intervention. Stepwise regression showed only level of education and age as useful predictors. Patients' beliefs, health status, and symptom severity as measured pre-intervention provided no explanation on the variation of post-intervention blood pressures.

In another study by Given, Given, and Coyle (1985), the relationship between attrition of 158 hypertensive individuals and identified predictor variables were investigated. The experimental subjects (103) received routine physician care and over six months they attended eight sessions to help identify behaviors and strategies for controlling their hypertension. The control group (55) received only routine physician care as needed.

The health belief measures used in this investigation were developed using samples of hypertensive patients. Twenty-six hypertensive patients were interviewed to learn about their beliefs and knowledge of their disease. A review of relevant literature and the results from these interviews were used to develop a pool of items. Factor analysis of the results from a sample of 196 hypertensive patients identified forty-one items that indicated five health belief

scales (severity of hypertension, efficacy of therapy, perceived difficulty in taking medications, perceived difficulty in following a diet, and perceived severity of symptoms related to hypertension). These scales were confirmed on a second independent sample. Alpha coefficients of .75 or higher were reported for all five scales.

In this study, a higher percentage of subjects in the control group left the study than those in the experimental group. Analysis of whether subjects left the study but not the care setting indicated that there was no significant difference between groups. The predictor variables that were analyzed were beliefs regarding the severity of disease, efficacy of therapy, perceived difficulty in taking medications and following a diet, and knowledge of the disease and perception of the severity of symptoms. The findings indicate that subjects who perceived difficulty in following a diet and perceived greater severity of symptoms were more likely to leave the study. Subjects with greater knowledge of their disease and those who participated in the experimental group were less likely to leave.

Fincham and Wertheimer (1985), in a comparison of health maintenance organization patients who were not compliant in having drug prescriptions filled with patients who did have drug prescriptions filled, found that individuals could be correctly classified into the two groups at a level of 68.7% by analysis of a 129 item instrument, adapted from an instrument developed by Leavitt (1979), that included 101 items representing components of the health belief model.

Ten components of the health belief model were measured by 101 items. Eighty-one of the 101 items measured four scales (susceptibility, severity, preventive health practices, and benefits of medical care) that were originally developed by Leavitt. Alpha reliabilities for these four scales for both this study

and for the Leavitt study were reported. The alpha coefficients were very similar for the two studies: Susceptibility .85 (.88 for Leavitt), severity .97 (.96), preventive health practices .96 (.96), and benefits of medical care .81 (.85). No other data on reliability or validity were reported.

The variables that resulted in the most discrimination between the two groups included: feedback on how to take the drug correctly, belief in benefits of medical care for symptoms or illness, convenience factors, length of membership in the HMO, and formal education.

Maiman, Becker, Kirscht, Haefner, and Drachman (1977) in a study of adherence by mothers to a diet regimen prescribed for their obese children evaluated the predictive value, the internal consistency, and the intercorrelation of indices reflecting the major dimensions of the Health Belief Model. This was the first reported test of the reliability of indices of the Health Belief Model. Internal consistency coefficients for the fifteen indices ranged from .47 to .96. No information is provided regarding the number of items within each index. The authors identified that the five indices that had coefficients between .47 and .60 were indices that either asked the mother to predict future outcomes or were related to topics that were not closely related to the dependent variable. The rest of the coefficients were above .80. These indices were more present oriented and closer to the dependent variable. The authors also noted that the magnitude of the correlation between those indices with lower internal consistency coefficients and weight loss was generally smaller than between indices with high internal consistency and weight loss.

Cummings, Jette, and Rosenstock (1978), using a multitrait-multimethod design, analyzed the construct validity of the original health belief model and found that perceptions of susceptibility, severity, barriers and benefits had

substantial convergent validity when measured using questionnaire or interview items. They also found that a seven point Likert scale was the best method of measurement.

These investigators also found that the perceptions of barriers and benefits are substantially different than perceptions of susceptibility and severity. Their analysis indicated that, although perceived susceptibility and perceived severity are different dimensions, there may be some overlap between the two. Their analysis also indicated that perceived benefits and barriers may be two ends of a continuum rather than two separate dimensions.

Jette, Cummings, Brock, Phelps, and Naessens (1981) investigated three methodological questions frequently raised in research involving the Health Belief Model. These questions were: 1) Are the Health Belief Model dimensions sufficiently distinct to be considered different beliefs, 2) Can reliable indices of these health beliefs be constructed, and 3) Are these constructed indices stable enough to be replicated across different samples, thus increasing their utility for research.

A thirty-one item interview questionnaire was administered over the telephone to two independent probability samples. Items were selected from questionnaires used in previous studies. Eight belief dimensions were represented. These were susceptibility to and severity of specific illnesses, general threat to health, concern about health matters, barriers to taking prescribed medications, health locus of control, trust in physicians, and health status.

Factor analysis indicated that all but six of thirty items factored to the belief to which the item had been attributed. This supports the idea that dimensions of the Health Belief Model are distinct enough to be considered

different beliefs. The Spearman-Brown formula was used to estimate the reliabilities of the indices. The reliability coefficients vary considerably within each sample and within factors between samples. In one sample the reliability coefficients range from .431 to .721 and in the second sample from .389 to .771. There is little difference between the samples for measures of general health concerns, perceived severity, barriers, and health locus of control. There were large differences in the measures of trust in doctor, perceived susceptibility, health status, and health concerns.

Given the lack of methodological research, the authors find these results promising for future research in developing better measures of health beliefs. The results also provided data that general and condition specific items within indices should be used with caution.

Champion (1984) describes the development of an instrument to measure health beliefs about breast self-examination behaviors. Scales to measure five dimensions (susceptibility, seriousness, benefits, barriers, and motivation) of the Health Belief Model were developed.

Cronbach alpha was used to compute reliability coefficients. Cronbach alphas for the five dimensions ranged from .60 to .78. Test-retest correlation coefficients on a sample of fifty-seven individuals ranged from .76 to .86 for all dimensions except benefits. The coefficient for benefits was .47, which was significant at the .001 level. The author believes that the first testing may have sensitized the individuals to the benefits of breast self-examination, thus increasing the benefit mean in the retest and decreasing the correlation coefficient.

Content validity was established by submitting the items to a panel of experts. Construct validity was evaluated using factor analysis and multiple

regression analysis. Factor analysis demonstrated the independence of the constructs. In all but one case the items on a factor were from the same construct. The results of the factor analysis indicated that the seriousness construct may not be unidimensional. Multiple regression analysis demonstrated that the frequency of breast self-examination is related to a combination of susceptibility, seriousness, benefits, barriers, and health motivation. Barriers accounted for 23% of the variance.

Rutledge (1987) used a modified version of the Champion Health Belief Model construct scale to measure the variables perceived susceptibility, seriousness, benefits, and barriers in a study of factors related to women's practice of breast self-examination. Alpha reliabilities on the four scales used in this study of ninety-three women ranged from .83 to .86.

Given, Given, Gallin, and Condon (1983) describe the development of scales to measure health beliefs of individuals with diabetes. Seventy-six items measuring twelve concepts were developed from three sources. These were previous instruments to measure health beliefs, a review of the literature related to diabetic patients' beliefs and reactions to their disease and therapeutic regimen, and interviews with twenty-five diabetic patients. In the first phase a factor analysis was performed on the results obtained from 156 diabetic patients. In phase two the scales that were derived from this first phase were cross-validated on a second sample of 92 diabetic patients.

A factor analysis of the first phase resulted in six final scales emerging from the data. Three of these scales were the same as proposed in the original twelve scales and three of the scales were combination of originally proposed concepts. Coefficient alphas for the resulting six scales for phase one ranged from .68 to .87. The authors conclude that the scales that emerged appear both

reliable and reproducible across samples. The scales also appear to measure distinct sets of beliefs.

Wagner and Curran (1984) used the Health Belief Model to examine the frequency and appropriate use of medical services by individuals who have been described by the health care community as "worried well." The "worried well" individual is one who repeatedly seeks medical care for symptoms for which no organic problem can be found. The investigators found that the dimensions of susceptibility, seriousness, and barriers to treatment are related to "worried well" behavior.

Construct validity of the dimensions of the Health Belief Model was reported using the results of a principal component varimax rotation factor analysis. Factors which related to the dimensions of barriers, symptom susceptibility, symptom seriousness, benefits of treatment from a therapist, and benefits of treatment from a physician were found. In a second larger sample the investigators report that five primary factors were extracted that were consistent with the Health Belief framework although more specific information about the factors was not described. The reported reliability of the dimension scales in the second sample was evaluated using Cronbach's alpha and ranged from .65 to .91.

Summary

Table 1 summarizes information about the Health Belief Model dimensions studied and the validity and reliability data on those instruments used for the studies included in this literature review.

The review of literature indicates that research using the Health Belief Model has relied on instruments that have not demonstrated adequate reliability and validity. Of the twenty-three studies reported, six report no information on

reliability or validity and two report information from other studies but not data obtained from their instruments or samples.

Seven studies reported only one measure of either reliability or validity. One of these studies reports only test-retest reliabilities. Five other studies report only internal consistency reliability coefficients ranging from .48-.96. One study used a multitrait-multimethod design to evaluate construct validity of the Health Belief Model.

Seven studies reported two measures of either reliability and or validity. Two of these studies reported test-retest and internal consistency reliability. Five studies reported use of factor analysis for construct validity and internal consistency reliability coefficients (.389-.89).

Only one study reported information on content and construct validity as well as internal consistency and test-retest reliability. This is the only study that would meet the minimal criteria reported by Norbeck (1985) for publishing results of instrument development. Criterion-related validity has not been determined in any study because of lack of other available measures for the constructs of the Health Belief Model.

Although much research has been done using health beliefs as a critical variable, it is evident that much of this research is flawed because of the use of measurement instruments with little if any psychometric testing. Recent research has indicated that it is most appropriate to develop health belief measurements that are population specific and not aimed at general health beliefs. This work has been accomplished most thoroughly with the diabetic population and with the preventive practice of breast self-examination. Other chronic illnesses are in need of measurement instruments that will withstand the rigors of psychometric testing.

No instrument used to measure the health beliefs of individuals with arthritis can be found in the literature. A review of literature describing instruments used for other populations demonstrates the need for development of an instrument that will include beginning estimates of test-retest and internal consistency reliability as well as content and construct validity.

TABLE 1
RESEARCH USING THE HEALTH BELIEF MODEL

AUTHOR	ILLNESS	INSTRUMENT	HEALTH BELIEF MODEL DIMENSIONS						RELIABILITY		VALIDITY	
			SUS	SEV	BEN	BAR	CTA	HM	TEST-RETEST	INTERNAL CONSISTENCY	CONTENT	CONSTRUCT
Becker, 1978	Asthma	Structured Interview	X					X	NO	NO	NO	NO
Harris & Linn, 1985	Diabetes Mellitus	40 item Diabetes Health Scale	X	X	X	X	X	X	NO	NO	NO	NO
Pederson, 1984	Pulmonary	Questionnaire		X					NO	NO	NO	NO
Nagy & Wolfe, 1984	Hypertension Diabetes Pulmonary	Structured Interview		X					NO	.37-.70	NO	NO
Algona, 1980	Diabetes	Severity Index of SCQ		X					NO	NO	NO	NO
Cerkoney, 1980	Diabetes	15 item adapted SCQ	X	X	X	X	X		88.6%	NO	NO	NO
DeVon & Powers, 1984	Hypertension	SCQ	X	X		X	X	X	Report Andreoli's	NO	Expert Author of SCQ	NO
Andreoli, 1981	Hypertension	Author developed Instrument(HBQ)	X	X	X				.70	.59-.71	NO	NO
Cronin, 1986	Hypertension	HBQ	X	X	X				Report Andreoli's	.53-.58	NO	NO
Holm, et al, 1985	MI, CABG	SCQ	X	X		X	X	X	Report Andreoli's	NO	Expert Author, Devon & Powers	NO
Tirrell, 1980	CABG	Modified SCQ Interview	X	X		X		X	NO	NO	NO	NO
Given, et al, 1984	Hypertension	Author developed Instrument		X					NO	>.75 for 4 scales .82 for SEV scale	NO	Factor Analysis
Given, et al, 1985	Hypertension	Author developed Instrument		X	X				NO	.75 or higher	NO	Factor Analysis

Table 1 — Continued.

AUTHOR	ILLNESS	INSTRUMENT	HEALTH BELIEF MODEL DIMENSIONS						RELIABILITY		VALIDITY	
			SUS	SEV	BEN	BAR	CTA	HM	TEST-RETEST	INTERNAL CONSISTENCY	CONTENT	CONSTRUCT
Fincham, 1985	Filling drug prescriptions	Derived from Leavitt's	X	X	X			X	NO	.91-.97	NO	NO
Maiman, 1977	Obese Children	Structured Interview	X	X	X	X		X	NO	.47-.96	NO	NO
Cummings, et al, 1978	Graduate Students	Author developed Instrument	X	X	X	X			NO	NO	NO	Multi-trait/Multi-method
Jette, et al, 1981	General Population	Interview Questionnaire	X	X		X			NO	.389-.771	NO	Factor Analysis
Champion, 1984	Breast Self-Exam	Author developed Instrument (CHBM)	X	X	X	X		X	.76-.86 (BEN .47)	.60-.78	Panel of Experts	Factor Analysis
Rutledge, 1987	Diabetes	Author developed Instrument				X	X		NO	.83-.86	NO	NO
Given, et al, 1983	Diabetes	Author developed Instrument			X	X			NO	.68-.89	NO	Factor Analysis
Smith, et al, 1987	Asthma	Author developed Instrument	X	X	X	X			NO	NO	NO	NO
McCallum, et al, 1988	Imagined Tuberculosis	Author developed Instrument	X	X	X	X	X	X	NO	.400-.719	NO	NO
Wagner & Curran, 1984	Worried Well	Author developed Instrument	X	X	X	X	X	X	NO	.65-.91	NO	Factor Analysis

SUS - Susceptibility; SEV - Severity; BEN - Benefits; BAR - Barriers; CTA - Cues to Action; HM - Health Motivation

SCQ - Standardized Compliance Questionnaire; HBQ - Health Belief Questionnaire; CHBM - Champion Health Belief Model

CHAPTER III

METHODOLOGY

The major objective of this research is to develop an instrument with appropriate validity and reliability to measure health beliefs in individuals with arthritis. The instrument will include each of the six dimensions (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to action, and health motivation) previously described as comprising the Health Belief Model.

Procedure

Sample

Two convenience samples were used in developing the health belief instrument for individuals with arthritis. Criteria for inclusion into both samples were the same. Subjects met the following criteria:

1. Adults over the age of eighteen.
2. Diagnosis of either osteoarthritis or rheumatoid arthritis.
3. Able to read and write the English language.

In order to maintain the independence of the two samples the first sample was drawn from the Arthritis Foundation, Illinois Chapter. Individuals who had completed the Arthritis Self-Help Course sponsored by the Illinois Chapter of the Arthritis Foundation in the previous year were asked to complete the instrument. The second sample was obtained from individuals currently being seen by a private physician with a specialty practice that included rheumatology.

The sample size for each stage in the development of the instrument was determined by the number of items in the instrument at that stage. The rationale for determining sample sizes by the number of items in the instrument at each stage of development was based on the planned use of factor analysis to determine construct validity. A minimum of five subjects for each item was desired.

Potential subjects for sample 1 were identified by the staff of the Arthritis Foundation, Illinois Chapter. The Foundation was provided with packets ready to be mailed that included the instrument, an information sheet about the study, a letter from the investigator explaining the purpose of the study, and a stamped addressed envelope. The staff of the Foundation inserted a cover letter from the Director of Public Relations of the Arthritis Foundation Illinois Chapter requesting that the individual participate in the study by completing and returning the questionnaire. Appendix A includes the information sheet, the letter from the investigator, and the letter from the Arthritis Foundation sent to subjects in Sample 1.

The head of three physician practice groups specializing in the area of rheumatology were contacted about their willingness to participate in this study by providing copies of the instrument to their patients. All three of the physician groups were located in a large midwestern metropolitan city. The primary hospital sites that each of the groups was affiliated with were large (over 500 beds) academic tertiary care medical centers. Potential subjects for sample 2 were identified by a nurse in each of the three private physicians groups that agreed to having their patients approached about the study. At the time of a regularly scheduled visit to the physician's office the nurse offered patients that

met the criteria for the study a packet that included the instrument, cover letter, and stamped addressed envelope.

As a result of this subject selection procedure, the study samples must be considered convenience samples. This limits the generalizability of the results.

In the first sample, questionnaires were mailed by the staff of the Arthritis Foundation, Illinois Chapter to 499 individuals who had participated in the Self Help Course in the previous year. Of these 267 (53.5%) were returned to the investigator. Twenty-seven of the returned questionnaires were not useable for the following reasons: twenty-three did not meet inclusion criteria and four were returned without being completed.

In the second sample, one hundred questionnaires were distributed at site A and fifty-eight were returned (58%), all but two met inclusion criteria. One hundred were distributed at site B and thirty-nine were returned (39%), one did not meet the inclusion criteria. One hundred fifty were distributed at site C and eighty-eight were returned (58.6%), and seven did not met the inclusion criteria. The overall return rate was 52.8%.

Instrument Development

Scales for each of the six dimensions of the Health Belief Model (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to action, and health motivation) were developed. Three strategies were used to identify potential behaviors and beliefs to be included for each of the dimensions:

1. Previously developed instruments measuring part or all of the Health Belief Model were reviewed (Andreoli, 1981; Given et al., 1983; Given, et al., 1984; Given, et al., 1985; Cummings, et al., 1978; Jette, et al., 1981; Champion, 1984; Holm, et al., 1985; Firlit, 1988)

2. A review of current literature on arthritis to identify behaviors and beliefs appropriate for each of the six dimensions.

3. Interviews with three clinical nurse specialists who work with individuals with arthritis as to their opinion of behaviors and beliefs that represent these six dimensions.

Six scales were developed that included ten to fourteen items representing each dimension (Table 2). Items were developed by modifying items from other instruments to reflect behaviors and beliefs specific to arthritis or by development of new items that the investigator believed represented important behaviors and beliefs of individuals with arthritis based on the literature and the interviews with expert clinicians in the area. A five point Likert scale was used to rate each of the items: 1= strongly agree, 2= agree, 3= undecided, 4= disagree, and 5= strongly disagree. Subjects were asked to indicate the choice that best described their belief about the statement in the item.

Reliability

Reliability of the instrument was evaluated in two ways. Internal consistency of the scales was evaluated using Cronbach's alpha. Test-retest reliability was established by administration of the fifty-six item questionnaire to forty-three subjects from the first sample approximately three weeks after initial completion of the questionnaire. Subjects were asked to provide their name and an address if they would be willing to complete another questionnaire in approximately three weeks. Questionnaires were coded so that confidentiality of responses was maintained.

TABLE 2
ORIGINAL ITEMS BY DIMENSION

PERCEIVED SUSCEPTIBILITY

1. My chances that my arthritis will get worse are great.
2. My physical health makes it more likely that my arthritis will get worse.
3. Within the next year my arthritis will get worse.
4. I worry alot about my arthritis getting worse.
5. In my current situation, I am highly susceptible to my arthritis getting worse.
6. If I don't use the advice my physician gave me I will end up with my arthritis getting worse.
7. If I use the advice my physician gave me my arthritis will get better.
8. If a person has arthritis it only lasts for a brief period of time.
9. I believe I really have arthritis.
10. Arthritis can be cured so it doesn't come back again.
11. One can have arthritis and not know it.
12. I believe I will have arthritis for the rest of my life.
13. I have arthritis because I participated in a lot of sports and exercises that caused damage to my joints.
14. I have arthritis because it runs in my family.

PERCEIVED SEVERITY

1. I expect to get over my arthritis completely.
2. My arthritis limits my daily activities.
3. My arthritis interferes with my going to work or school.
4. It worries me to think about the effect my arthritis will have on my health.
5. My arthritis will have a serious effect on my future health.
6. My arthritis keeps me from doing things I want to do.
7. My arthritis will cause me to be sick alot.
8. Arthritis is a mild health problem.
9. Having hypertension is more serious to one's health than having arthritis.
10. Having diabetes is more serious to one's health then having arthritis.
11. Having the flu is more dangerous to one's health then having arthritis.

TABLE 2--Continued.

PERCEIVED BARRIERS

1. I have trouble getting my arthritis medicine prescriptions filled.
2. To do exercises for my arthritis I have to take time off of work.
3. To go to the doctor for my arthritis I have to take time off of work.
4. The medicine for my arthritis makes me fell worse than I do when I don't take it.
5. My out-of-pocket expenses for my arthritis medicine is very high.
6. The arthritis self-management techniques I am aware of are too time consuming.
7. To do my joint exercises causes too much pain.
8. It isn't easy for me to learn the exercises for my arthritis.
9. I would have to change too many daily activities to include the arthritis self-management techniques I have been told about.
10. It is impossible for me to take care of my joints properly while at work.
11. It is too inconvenient for me to do my exercises.

PERCEIVED BENEFITS

1. Exercise helps my arthritis.
2. In terms of my arthritis, I find that some of the old fashioned remedies are still better than the things the doctors prescribe.
3. If I don't take care of my joints properly, my joint pain will get worse.
4. Taking my arthritis medicine as prescribed will make me feel better.
5. Using arthritis self-management techniques will make me feel better.
6. Using joint protection techniques is something I must do no matter how inconvenient it is.
7. Keeping my weight close to my ideal weight helps control my arthritis.
8. Taking my arthritis medication slows down the progression of my arthritis.
9. Doing things to protect my joints from stress slows down the progression of my arthritis.
10. Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.

TABLE 2--Continued.

CUES TO ACTION

1. I have family or friends that have arthritis and who live pretty normal lives.
2. I'd probably take care of my joints properly if I were reminded to.
3. I use joint protection techniques more when my joints hurt.
4. I take my arthritis medication the way it is prescribed when I have more pain than usual.
5. Going to meetings with other people who have arthritis helps me to do the things that make my arthritis more manageable.
6. Someone in my family helps me remember to take my arthritis medication regularly.
7. I do my exercises regularly because someone in my family encourages me to do them.
8. When my arthritis begins to interfere more with my daily living than I am more consistent with taking my medications
9. When my arthritis begins to interfere more with my daily living then I do my exercises regularly.
10. Certain times of the year cause my arthritis to flare and I make sure that I am more consistent with my activities to control my arthritis during those times.

GENERAL HEALTH MOTIVATION

1. Most of what happens to my health is a matter of choice.
2. There are things that I can do to be healthy and avoid illness.
3. I try to do exactly what my doctor tells me to do.
4. I worry alot about my health.
5. I eat a well-balanced diet.
6. I always follow medical orders because I believe they will benefit my state of health.
7. I frequently do things to improve my overall health.
8. I search for new information related to my health.
9. I have regular physical examinations in addition to visits to the doctor for my arthritis.
10. I have regular dental examination in addition to visits for a specific problem.
11. I exercise regularly - at least three times a week.
12. Although I am concerned about my health, there are other things in my life right now that have priority over health care.
13. I am concerned about my health.

Validity

Expert judgment was used to demonstrate content validity of the items for each of the six dimensions, (perceived severity, perceived susceptibility, perceived barriers to treatment, perceived benefits to treatment, cues to action, and general health motivation) included in the instrument. A panel of thirteen individuals who have done research involving the Health Belief Model were asked to review each item. These thirteen individuals included doctorally prepared nursing faculty from three universities and doctoral students in nursing all of whom were conducting research using the Health Belief Model. Each judge was given the sixty-nine items along with definitions of each dimensions (See Chapter 1) and asked to identify that dimension they believed each item best represented. A not applicable category was also provided for items where the judge did not believe a match between dimension definition and item existed. Items which had a level of interrater agreement of at least 54% or above by this panel of experts were used to develop a scale for each of the six dimensions. Each of the six scales contained eight to eleven items (Table 3). This resulted in a questionnaire that included fifty-six items (Appendix B).

Construct validity of the instrument was evaluated by use of principal component orthogonal rotation factor analysis. The first factor analysis was done on the data collected in the first sample. Participants in the first sample completed the fifty-six item questionnaire. Based on the results of this first factor analysis, the six scales were revised (Table 4). The revised instrument includes thirty-three items (Appendix C). A second sample completed the thirty-three item questionnaire. Further construct validity was evaluated by means of a factor analysis on the second sample. A Statistical Package for Social Sciences (SPSSX) program for principal component orthogonal rotation factor

analysis was used for both. The results of the factor analyses are discussed in Chapter IV.

TABLE 3
SIX SCALES FOR QUESTIONNAIRE 1

Item	Content
PERCEIVED SUSCEPTIBILITY	
SUS1	In my current situation, I am highly susceptible to my arthritis getting worse.
SUS2	I believe I really have arthritis.
SUS3	I have arthritis because I participated in a lot of sports and exercises that caused damage to my joints.
SUS4	I have arthritis because it runs in my family.
SUS5	My chances that my arthritis will get worse are great.
SUS6	Within the next year my arthritis will get worse.
SUS7	I believe I will have arthritis for the rest of my life.
SUS8	Due to the condition of my physical health my arthritis is likely to get worse.
SUS9	I worry alot about my arthritis getting worse.
PERCEIVED SEVERITY	
SEV1	My arthritis limits my daily activities.
SEV2	My arthritis will have a serious effect on my future health.
SEV3	I have family or friends that have arthritis and who live pretty normal lives.
SEV4	My arthritis keeps me from doing things I want to do.
SEV5	My arthritis interferes with my going to work or school.
SEV6	Having the flu is more dangerous to one's health then having arthritis.
SEV7	It worries me to think about the effect my arthritis will have on my health.
SEV8	Having hypertension is more serious to one's health than having arthritis.
SEV9	If a person has arthritis it only lasts for a brief period of time.

TABLE 3--CONTINUED.

Item	Content
PERCEIVED BARRIERS	
BAR1	I have trouble getting my arthritis medicine prescriptions filled.
BAR2	To do exercises for my arthritis I have to take time off of work.
BAR3	To go to the doctor for my arthritis I have to take time off of work.
BAR4	My out-of-pocket expenses for my arthritis medicine is very high.
BAR5	The arthritis self-management techniques I am aware of are too time consuming.
BAR6	To do my joint exercises causes too much pain.
BAR7	It isn't easy for me to learn the exercises for my arthritis.
BAR8	I would have to change too many daily activities to include the arthritis self-management techniques I have been told about.
BAR9	It is impossible for me to take care of my joints properly while at work.
BAR10	It is too inconvenient for me to do my exercises.
BAR11	The medicine for my arthritis makes me fell worse than I do when I don't take it.
PERCEIVED BENEFITS	
BEN1	Keeping my weight close to my ideal weight helps control my arthritis.
BEN2	Taking my arthritis medication slows down the progression of my arthritis.
BEN3	Doing things to protect my joints from stress slows down the progression of my arthritis.
BEN4	Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.
BEN5	Exercise helps my arthritis.
BEN6	Taking my arthritis medicine as prescribed will make me feel better.
BEN7	Using arthritis self-management techniques will make me feel better.
BEN8	If I don't use the advice my physician gave me I will end up with my arthritis getting worse.
BEN9	If I use the advice my physician gave me my arthritis will get better.
BEN10	I always follow medical orders because I believe they will benefit my state of health.

TABLE 3--Continued.

Item	Content
CUES TO ACTION	
CTA1	I'd probably take care of my joints properly if I were reminded to.
CTA2	Someone in my family helps me remember to take my arthritis medication regularly.
CTA3	I do my exercises regularly because someone in my family encourages me to do them.
CTA4	When my arthritis begins to interfere more with my daily living then I do my exercises regularly.
CTA5	I use joint protection techniques more when my joints hurt.
CTA6	When my arthritis begins to interfere more with my daily living then I am more consistent with taking my medications.
CTA7	I take my arthritis medication the way it is prescribed when I have more pain than usual.
CTA8	Going to meetings with other people who have arthritis helps me to do the things that make my arthritis more manageable.
GENERAL HEALTH MOTIVATION	
HM1	I have regular physical examinations in addition to visits to the doctor for my arthritis.
HM2	I have regular dental examination in addition to visits for a specific problem.
HM3	I search for new information related to my health.
HM4	I exercise regularly - at least three times a week.
HM5	I worry alot about my health.
HM6	I frequently do things to improve my overall health.
HM7	I am concerned about my health.
HM8	I eat a well-balanced diet.
HM9	Although I am concerned about my health, there are other things in my life right now that have priority over health care.

TABLE 4
SIX SCALES FOR QUESTIONNAIRE 2

Item	Content
PERCEIVED SUSCEPTIBILITY	
SUS4	I have arthritis because it runs in my family.
SUS5	My chances that my arthritis will get worse are great.
SUS6	Within the next year my arthritis will get worse.
SUS8	Due to the condition of my physical health my arthritis is likely to get worse.
SUS9	I worry alot about my arthritis getting worse.
SEV7	It worries me to think about the effect my arthritis will have on my health.
PERCEIVED SEVERITY	
SEV1	My arthritis limits my daily activities.
SEV4	My arthritis keeps me from doing things I want to do.
SEV5	My arthritis interferes with my going to work or school.
SEV6	Having the flu is more dangerous to one's health then having arthritis.
SEV8	Having hypertension is more serious to one's health than having arthritis.
PERCEIVED BARRIERS	
BAR5	The arthritis self-management techniques I am aware of are too time consuming.
BAR6	To do my joint exercises causes too much pain.
BAR7	It isn't easy for me to learn the exercises for my arthritis.
BAR8	I would have to change too many daily activities to include the arthritis management techniques I have been told about.
BAR10	It is too inconvenient for me to do my exercises.

TABLE 4--Continued.

Item	Content
PERCEIVED BENEFITS	
BEN1	Keeping my weight close to my ideal weight helps control my arthritis.
BEN2	Taking my arthritis medication slows down the progression of my arthritis.
BEN4	Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.
BEN5	Exercise helps my arthritis.
BEN6	Taking my arthritis medicine as prescribed will make me feel better.
BEN8	If I don't use the advice my physician gave me I will end up with my arthritis getting worse.
BEN9	If I use the advice my physician gave me my arthritis will get better.
CUES TO ACTION	
CTA1	I'd probably take care of my joints properly if I were reminded to.
CTA2	Someone in my family helps me remember to take my arthritis medication regularly.
CTA4	When my arthritis begins to interfere more with my daily living then I do my exercises regularly.
CTA6	When my arthritis begins to interfere more with my daily living then I am more consistent with taking my medications.
CTA7	I take my arthritis medication the way it is prescribed when I have more pain than usual.
GENERAL HEALTH MOTIVATION	
HM1	I have regular physical examinations in addition to visits to the doctor for my arthritis.
HM2	I have regular dental examination in addition to visits for a specific problem.
HM3	I search for new information related to my health.
HM4	I exercise regularly - at least three times a week.
HM6	I frequently do things to improve my overall health.

Procedural Limitations

In the development of this instrument several procedural limitations must be noted. The methodologies used to evaluate validity required determination of acceptable statistical values for specific measures of validity. The establishment of acceptable values served as the basis for the development of decision rules .

Content validity was evaluated by use of expert judgement. In the development of the original items and in the review by the panel of experts the possibility of bias and subjectivity must be considered. The decision to include items in the first questionnaire was based on a level of interrater agreement of 75%. The use of a level of 75% interrter agreement resulted in the deletion of several items that were considered conceptually important based on the review of literature and interviews with the nurse clinical specialists. As a result it was decided to include items that were considered conceptually important and had an interrater level of agreement of at least 54% (Kavanagh, 1989).

Construct validity was evaluated by use of factor analysis. In interpreting the results of the factor analyses Nunnally (1978) suggests two rules of thumb which were used in the development of this instrument. The first is that factors with eigenvalues of 1.00 or greater be used in subsequent rotations. This rule resulted in the determination of 10 factors for each of the two samples. He also suggests that variables that have loadings of .30 or higher be considered since loadings smaller than this cannot be considered seriously. In this study variables with loadings less than .40 were not considered.

Regardless of the rules used in interpreting factor analyses Nunnally (1978) cautions that the factors should be replicated in future studies due to the possible instability of the factors. This potential instability may be caused by

characteristics of the sample including its size. Factors which can be replicated over several large samples can be used with a greater degree of confidence then can those determined by only one sample or several small samples.

These procedural decision rules must be viewed as limitations to this study. Future research using this instrument should continue to evaluate the use of specific items and the factors identified in subsequent factor analyses.

Pilot Study

Prior to data collection, a pilot study was conducted using twenty individuals who met the criteria for the study. In addition to the questionnaire five general questions were asked of the subjects to assist in evaluating the questionnaire. These questions were

1. Did you have any trouble reading the questions?
2. Did you have trouble understanding any questions?
3. Were there any words or phrases you did not understand?
4. Did you have any trouble following the directions?
5. Please include any other comments that you have about this questionnaire.

Following the pilot study minor modification was made in the wording of one question. The pilot study results were included in subsequent data analysis.

Demographics

Information about age, sex, diagnosis, years since diagnosis, racial/ethnic background, marital status, social status, family income, and religion was collected in order to describe and compare the two samples. Comparison of the two samples was done to evaluate any similarities or differences that might influence the results of the instrument being developed.

Socioeconomic status was measured using the Hollingshead Four-Factor Index of Social Status (Hollingshead, 1975).

The Hollingshead Four-Factor Index of Social Status incorporates information on sex, marital status, occupation, and education and provides an indication of an individual or family's position in the class structure. A total score is produced by summing the weighted occupation and education indicators by five and three respectively. The possible range of scores is from 8-66 with a higher score indicating a higher social status. This index is described as a reliable measure of the social position of adults.

Protection of Human Subjects

Institutional approval was obtained prior to data collection from the Institutional Review Board of Loyola University. The Human Subjects Committee of Lutheran General Hospital also reviewed and approved the proposal prior to data collection for the second sample. This was necessary because one of the physician practice groups was affiliated with Lutheran General Hospital and required this approval.

The purpose of the study was explained to each participant by use of an information sheet attached to each questionnaire (Appendix A). By agreeing to complete and return the questionnaire, each participant provided their consent. Because of the nature of the study a consent form was not required.

Confidentiality of the subjects was protected by not requiring identification of the subjects. Those subjects who agreed to participate in completing a second questionnaire were given a code number and all instruments returned were matched by code number. All data were analyzed by group so that no information could be traced back to any subject.

Summary

The design of this research supports the development of a psychometrically sound instrument to measure health beliefs in individuals with arthritis, including measures to evaluate both the reliability and validity of the instrument. In addition, information on demographic data was included in order to compare the two samples. Because of the use of convenience samples, results from this research need to be used cautiously in making generalizations to the population of individuals with arthritis as a whole.

CHAPTER IV

RESULTS

The study results are presented in three sections. The first section contains the description of the process used to develop the instrument. The second section discusses the validity and reliability measures of the instrument. The third section describes the two samples.

Development of Instrument

An ideal instrument would be clinically practical and psychometrically sound. To be clinically practical requires as concise an instrument as possible. To evaluate the internal consistency of a scale requires a minimum of five items. The goal was to develop an instrument that would include thirty to thirty-five items with each dimension of the Health Belief Model having a scale comprised of five to six items. Instrument development was begun with the identification of 69 potential items.

These items were developed for inclusion in the instrument by reviewing previously developed instruments measuring part or all of the dimensions of the Health Belief Model, reviewing literature related to arthritis that identified content areas that reflected the dimensions of the model, and interviewing three clinical nurse specialists in the area of arthritis for content they believed would be common to individuals with arthritis.

Each of the six dimensions included ten to fourteen items. These sixty-nine items were randomly ordered and evaluated by a panel of thirteen individuals who have done research involving the Health Belief Model. Table 5

shows the interrater agreement for each of the original items evaluated by the panel of experts. The table is organized using the dimension that was believed to be represented by the item. Several items had a higher percent of agreement for a dimension other than the one believed to be represented. This is indicated in Table 5.

TABLE 5

INTERRATER AGREEMENT

	Item	% Agreement
PERCEIVED SUSCEPTIBILITY		
1.	My chances that my arthritis will get worse are great.	62
2.	My physical health makes it more likely that my arthritis will get worse.	54
3.	Within the next year my arthritis will get worse.	62
4.	I worry alot about my arthritis getting worse.	54
5.	In my current situation, I am highly susceptible to my arthritis getting worse.	100
6.	If I don't use the advice my physician gave me I will end up with my arthritis getting worse. (Benefits 85%)	15
7.	If I use the advice my physician gave me my arthritis will get better. (Benefits 85%)	8
8.	If a person has arthritis it only lasts for a brief period of time. (Severity 76%)	23
9.	I believe I really have arthritis.	92
10.	Arthritis can be cured so it doesn't come back again.	46
11.	One can have arthritis and not know it.	46
12.	I believe I will have arthritis for the rest of my life.	62
13.	I have arthritis because I participated in a lot of sports and exercises that caused damage to my joints.	76
14.	I have arthritis because it runs in my family.	76
PERCEIVED SEVERITY		
1.	I expect to get over my arthritis completely. (Susceptibility 54%)	23
2.	My arthritis limits my daily activities.	92
3.	My arthritis interferes with my going to work or school.	85
4.	It worries me to think about the effect my arthritis will have on my health.	76
5.	My arthritis will have a serious effect on my future health.	92
6.	My arthritis keeps me from doing things I want to do.	85
7.	My arthritis will cause me to be sick alot.	62
8.	Arthritis is a mild health problem.	69
9.	Having hypertension is more serious to one's health than having arthritis.	76
10.	Having diabetes is more serious to one's health then having arthritis.	69
11.	Having the flu is more dangerous to one's health then having arthritis.	85

Table 5--Continued.

Item	% Agreement
PERCEIVED BARRIERS	
1. I have trouble getting my arthritis medicine prescriptions filled.	100
2. To do exercises for my arthritis I have to take time off of work.	100
3. To go to the doctor for my arthritis I have to take time off of work.	100
4. The medicine for my arthritis makes me fell worse than I do when I don't take it.	92
5. My out-of-pocket expenses for my arthritis medicine is very high.	100
6. The arthritis self-management techniques I am aware of are too time consuming.	100
7. To do my joint exercises causes too much pain.	100
8. It isn't easy for me to learn the exercises for my arthritis.	100
9. I would have to change too many daily activities to include the arthritis self-management techniques I have been told about.	100
10. It is impossible for me to take care of my joints properly while at work.	100
11. It is too inconvenient for me to do my exercises.	100
PERCEIVED BENEFITS	
1. Exercise helps my arthritis.	92
2. In terms of my arthritis, I find that some of the old fashioned remedies are still better than the things the doctors prescribe.	69
3. If I don't take care of my joints properly, my joint pain will get worse.	69
4. Taking my arthritis medicine as prescribed will make me feel better.	92
5. Using arthritis self-management techniques will make me feel better.	92
6. Using joint protection techniques is something I must do no matter how inconvenient it is.	54
7. Keeping my weight close to my ideal weight helps control my arthritis.	100
8. Taking my arthritis medication slows down the progression of my arthritis.	100
9. Doing things to protect my joints from stress slows down the progression of my arthritis.	100
10. Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.	100

Table 5--Continued.

	Item	% Agreement
CUES TO ACTION		
1.	I have family or friends that have arthritis and who live pretty normal lives. (Severity 92%)	0
2.	I'd probably take care of my joints properly if I were reminded to.	92
3.	I use joint protection techniques more when my joints hurt.	69
4.	I take my arthritis medication the way it is prescribed when I have more pain than usual.	54
5.	Going to meetings with other people who have arthritis helps me to do the things that make my arthritis more manageable.	54
6.	Someone in my family helps me remember to take my arthritis medication regularly.	92
7.	I do my exercises regularly because someone in my family encourages me to do them.	76
8.	When my arthritis begins to interfere more with my daily living then I am more consistent with taking my medications.	62
9.	When my arthritis begins to interfere more with my daily living then I do my exercises regularly.	69
10.	Certain times of the year cause my arthritis to flare and I make sure that I am more consistent with my activities to control my arthritis during those times.	46
GENERAL HEALTH MOTIVATION		
1.	Most of what happens to my health is a matter of choice.	62
2.	There are things that I can do to be healthy and avoid illness.	62
3.	I try to do exactly what my doctor tells me to do. (Benefits 38%)	15
4.	I worry alot about my health.	85
5.	I eat a well-balanced diet.	76
6.	I always follow medical orders because I believe they will benefit my state of health. (Benefits 62%)	31
7.	I frequently do things to improve my overall health.	85
8.	I search for new information related to my health.	92
9.	I have regular physical examinations in addition to visits to the doctor for my arthritis.	100

Table 5--Continued.

	Item	% Agreement
GENERAL HEALTH MOTIVATION (continued)		
10.	I have regular dental examination in addition to visits for a specific problem.	100
11.	I exercise regularly - at least three times a week.	92
12.	Although I am concerned about my health, there are other things in my life right now that have priority over health care.	54
13.	I am concerned about my health.	85

Items with an interrater level of agreement of at least 75% and those items that were believed to be conceptually important (all with an interrater level of agreement of at least 54%) were used to develop scales for each of the six dimensions of the Health Belief Model. These six scales were used in the questionnaire given to the first sample. The questionnaire administered to the first sample contained fifty-six items. Each of the six scales included eight to eleven items (See Table 3).

Of the returned questionnaires from the first sample, 240 questionnaires met the inclusion criteria for the study and were used in the subsequent analyses. Development of the instrument was continued with the use of factor analysis on the data gathered from the first sample. Although the ideal number of questionnaires would have been at least 280 (minimum of five questionnaires per item) it was decided to proceed with 240. This was because of the method of questionnaire distribution requested by the Arthritis Foundation, Illinois Chapter. The Arthritis Foundation, Illinois Chapter mailed the questionnaires to potential subjects so it was not possible to send follow up remainders to those individuals who had not returned their questionnaire. The

possibility of using individuals from the second sample sources as subjects for the first sample was considered and discarded in order to keep the two samples as independent as possible.

Both principal axis and principal component analyses were performed. In addition both orthogonal and oblique rotations were performed in order to detect the most meaningful relationships among items. Initially all four analyses (principal component orthogonal, principal component oblique, principal axis orthogonal, and principal axis oblique) were evaluated and all items with factor loadings below .40 on all four analyses were dropped. On the first analyses three items were dropped (BAR4, SUS1, CTA3).

BAR4 - My out of pocket expenses for my arthritis medicine is very high.

SUS1 - In my current situation, I am highly susceptible to my arthritis getting worse.

CTA3 - I do my exercises regularly because someone in my family encourages me to do them.

The next analyses of 53 items resulted in an additional two items being dropped (BEN3 and SUS7).

BEN3 - Doing things to protect my joints from stress slows down the progression of my arthritis.

SUS7 - I believe I will have arthritis for the rest of my life.

On a third round of analyses two additional items were dropped because they had factor loadings below .40 on all four analyses (HM8 and SEV3).

HM8 - I eat a well-balanced diet.

SEV3 - I have family or friends that have arthritis and who live pretty normal lives.

The sixteen factors identified in the analysis of forty-nine items was then carefully scrutinized for the content of the items for each factor. An additional seventeen items were deleted because they did not conceptually fit with the other items in the factor.

SUS2 - I believe I really have arthritis.

SUS3 - I have arthritis because I participated in a lot of sports and exercises that caused damage to my joints.

SEV2 - My arthritis will have a serious effect on my future health.

SEV9 - If a person has arthritis it only lasts for a brief period of time.

BAR1 - I have trouble getting my arthritis medicine prescriptions filled.

BAR2 - To do exercises for my arthritis I have to take time off of work.

BAR3 - To go to the doctor for my arthritis I have to take time off of work.

BAR9 - It is impossible for me to take care of my joints properly while at work.

BEN7 - Using arthritis self-management techniques will make me feel better.

BEN10 - I always follow medical orders because I believe they will benefit my state of health.

CTA5 - I use joint protection techniques more when my joints hurt.

CTA8 - Going to meetings with other people who have arthritis helps me to do the things that make my arthritis more manageable.

HM5 - I worry alot about my health.

HM7 - I am concerned about my health.

HM9 - Although I am concerned about my health, there are other things in my life right now that have priority over health care.

Consistently the principal component orthogonal rotation demonstrated the best fit of items on the analyses performed. The results of the principal component orthogonal rotation analysis for fifty-six, fifty-three, fifty-one and forty-nine items are shown in Appendix D.

This resulted in thirty-two items remaining. Each dimension scale had five to seven items except the cues to action scale which had only four items. The cues to action items that had previously been deleted as described above were each added separately to identify which had the strongest relationship to the other cues to action items. Item CTA1 (I'd probably take care of my joints properly if I were reminded to) was found to have the strongest relationship to the other cues to action items and was added to the instrument. This was done so that the cues to action scale would have a minimum of five items. This resulted in a total of thirty-three items.

Table 6 includes the results of the principal component orthogonal rotation of the thirty-three items from the first sample. Ten factors were identified with Eigenvalues of from 5.38 to 1.05, accounting for a total of 63.2% of the variance. Four of the six scales are a combination of two factors. Further discussion of the items within the ten factors is found later in the chapter regarding the construct validity of the instrument.

These thirty-three items were contained in the questionnaire administered to the second independent sample. The purpose of a second sample was to validate the results of the analysis of the first sample. The second sample was comprised of 175 subjects from three private physician practice groups that specialized in the care of individuals with arthritis.

TABLE 6

RESULTS OF VARIMAX ROTATION OF HEALTH BELIEF SCALES - SAMPLE 1

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR10	.745	.046	.030	-.063	.176
BAR8	.732	.146	.173	.151	.092
BAR5	.688	.001	.300	-.008	-.078
BAR7	.665	-.108	.006	.138	.302
BAR6	.637	.068	.102	.196	.029
BEN6	-.067	.761	.101	.070	-.112
BEN4	-.057	.750	.187	-.076	-.091
BEN2	.125	.704	.191	.005	-.084
BEN9	.253	.585	.005	-.234	.088
BEN8	-.006	.530	-.120	-.090	.157
CTA6	.052	.087	.769	.093	.131
CTA7	.091	.110	.672	-.100	.082
CTA4	.155	.081	.611	.036	.107
CTA2	.174	.250	.590	.217	.001
CTA1	.401	.046	.551	.000	.040
SEV1	.079	-.046	-.009	.833	.187
SEV4	.054	-.020	.023	.802	.250
SEV5	.425	-.086	.159	.581	-.136
SUS8	.208	.074	.148	.031	.750
SUS5	.028	-.132	.099	.152	.690
SUS6	.238	-.146	.097	.350	.676
SUS9	.134	-.074	.058	.421	.188
SEV7	.258	-.050	.024	.463	.160
SUS4	-.013	.073	.282	-.066	.062
HM3	.039	.107	-.067	-.010	-.029
HM6	-.085	.114	.114	-.053	-.021
HM4	-.234	.009	.168	.128	-.055
Eigenvalue	5.38	3.65	2.38	1.67	1.59
% of Total Variance	16.3	11.1	7.2	5.1	4.8
Cum. % of Variance	16.3	27.4	34.6	39.7	44.5

Table 6--Continued.

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BEN1	-.089	.058	-.094	.002	.111
BEN5	-.225	.178	.100	-.087	-.123
SEV6	.032	.055	.129	.047	-.097
SEV8	-.100	.064	-.019	-.013	.048
HM2	.031	.052	-.036	-.038	.073
HM1	.016	.068	-.050	-.063	.018
	6	7	8	9	10
BAR10	-.013	-.019	-.218	.056	-.094
BAR8	.017	-.050	-.070	-.074	-.102
BAR5	.264	-.156	-.102	.089	.080
BAR7	-.008	.114	.031	-.030	.095
BAR6	.056	-.066	-.083	-.107	.095
BEN6	.113	.111	.064	.190	.167
BEN4	-.127	-.008	.016	.091	.202
BEN2	-.083	-.023	.030	-.135	-.036
BEN9	.025	.260	.082	-.034	-.224
BEN8	.309	.262	.325	.243	-.071
CTA6	-.131	.084	-.081	-.070	-.060
CTA7	.126	.049	-.149	.182	-.089
CTA4	.329	.074	.167	.084	.024
CTA2	-.248	-.101	.144	.015	.051
CTA1	.266	-.034	.052	-.031	-.031
SEV1	.083	.082	-.024	.030	-.112
SEV4	.126	-.033	-.126	.025	-.016
SEV5	.085	-.052	.142	-.011	.010
SUS8	.102	-.078	.138	-.104	-.136
SUS5	.158	.038	-.067	.014	.167
SUS6	-.005	-.065	-.061	.042	.100

Table 6--Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
SUS9	.681	-.129	.089	.102	-.039
SEV7	.654	-.095	.102	-.052	-.031
SUS4	.413	.114	-.245	-.085	.158
HM3	.172	.756	-.060	-.112	.111
HM6	-.158	.691	.046	.187	.138
HM4	-.202	.546	.389	.041	.055
BEN1	.128	-.047	.742	-.022	.114
BEN5	-.109	.161	.713	-.009	.055
SEV6	-.061	.066	-.007	.824	-.077
SEV8	-.040	-.009	-.003	.789	.174
HM2	-.140	.087	.057	.030	.762
HM1	.182	.145	.092	.060	.683
Eigenvalue	1.45	1.28	1.21	1.17	1.05
% of total variance	4.4	3.9	3.7	3.5	3.2
Cum. % o variance	48.9	52.8	56.4	60.0	63.2

Table 7 shows the results of a principal component orthogonal rotation factor analysis of this second sample using the thirty-three items identified in the analysis of the first sample. Ten factors were extracted with Eigenvalues of 6.22 to 1.04, accounting for a cumulative 66.2% of the variance.

Strong validation of the factors that were identified in the first sample did not occur with analysis of the second sample. In general many of the factors were similar from one sample to the other, and the scales of barriers, benefits, general health motivation, perceived severity, and perceived susceptibility remained largely intact. Items thought to represent the dimensions of benefits and general health motivation loaded with different items in the second sample yet with the exception of items BEN5 (Exercise helps my arthritis) and HM2 (I have regular dental examinations in addition to visits for a specific problem) still remained with items representing the same dimension. The factor that represented the cues to action scale in the first sample dispersed over three factors in the second sample. Table 8 compares the factors from sample one and sample two. One possible reason for this instability in factors may be the difference in the arthritis diagnoses between the two groups that was found to be significant. This finding is discussed in the section of this chapter addressing the demographic description of the two samples.

To further explore the differences in the two samples a discriminant analysis was performed. The results of the discriminant analysis was significant (Wilks' Lambda=0.788, Chi-Square=94.397, D.F.-33, p=0.000). However analysis of the results showed no pattern as to the items that discriminated between the two samples. Using a standardized canonical discriminant function coefficient of greater than or equal to 0.100 or -0.100 Table 9 shows

TABLE 7

RESULTS OF VARIMAX ROTATION OF HEALTH BELIEF SCALES - SAMPLE 2

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR8	.779	.224	.060	.037	.060
BAR5	.753	.047	.178	.009	.021
BAR6	.708	.083	.071	.017	.023
CTA4	.763	.075	.095	.047	.203
CTA1	.613	.113	-.009	.152	.315
BAR7	.581	.020	.037	.438	-.292
BAR10	.578	.166	.008	.148	-.433
SEV4	.012	.830	-.021	.202	-.111
SEV1	.169	.820	.106	.115	-.017
SEV5	.281	.709	.055	.160	.079
BEN4	.314	-.169	.682	-.127	.139
BEN6	.095	.156	.676	-.183	.269
BEN8	.053	.135	.608	.078	.183
BEN1	.076	.166	.518	-.125	.019
SUS4	.106	-.032	.511	.342	.062
SUS8	-.038	.136	.114	.746	-.050
SUS6	.140	.326	-.124	.624	.067
CTA2	.129	.110	-.217	.586	.069
SUS5	.230	.276	-.083	.544	.050
HM4	.073	.077	.160	.024	.749
BEN5	.059	-.072	.207	-.072	.749
HM1	.295	-.118	.292	.256	.402
SUS9	.332	.237	.136	.150	-.006
SEV7	.344	.259	.076	.188	-.072
Eigenvalue	6.22	3.50	2.33	1.96	1.70
% of Total Variance	18.9	10.6	7.0	5.9	5.1
Cum. % of Variance	18.9	29.5	36.5	42.5	47.6

Table 7--Continued.

Item	Factors and Sorted Loadings				
	1	2	3	4	5
CTA6	.112	-.028	-.004	.128	.012
CTA7	.299	.060	.186	.068	.047
BEN9	.118	-.055	.120	-.055	-.034
BEN2	-.271	-.010	.426	.114	.008
SEV8	.040	-.055	.040	-.001	-.009
SEV6	.189	-.098	-.005	.077	-.080
HM2	.007	-.182	-.188	-.172	.353
HM3	.006	.053	-.015	.022	.005
HM6	-.026	-.071	.093	.017	.435
	6	7	8	9	10
BAR8	.081	.131	-.011	.176	-.105
BAR5	.246	.068	.006	.061	-.017
BAR6	.240	.001	-.054	.032	.029
CTA4	.118	.262	.086	.008	.083
CTA1	-.027	.252	.031	.071	-.210
BAR7	-.012	-.020	.107	-.075	.199
BAR10	-.341	-.014	-.114	.067	.058
SEV4	.108	-.057	-.060	-.041	-.049
SEV1	.197	-.043	-.019	-.053	.023
SEV5	.053	.153	.000	-.087	.025
BEN4	-.159	.020	.029	-.220	-.043
BEN6	.037	-.085	.109	-.103	.050
BEN8	.283	.118	.184	.179	-.102
BEN1	.226	.211	.291	.309	.150
SUS4	.135	.284	-.139	.125	.104
SUS8	.122	.058	.071	.119	.045
SUS6	-.002	.044	-.298	-.142	.003
CTA2	.031	.185	.257	-.005	-.277
SUS5	.143	.075	-.271	-.016	.126

Table 7--Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
HM4	-.060	.014	.075	.050	.134
BEN5	-.010	.083	-.076	-.158	.075
HM1	.062	-.129	-.134	.092	.017
SUS9	.751	.010	-.071	-.124	.072
SEV7	.750	.065	.019	-.137	.073
CTA6	.024	.838	.086	.023	.118
CTA7	.025	.770	-.042	-.017	-.147
BEN9	.032	.032	.796	-.063	-.114
BEN2	-.169	.058	.555	-.175	.107
SEV8	-.011	.014	-.280	.772	.082
SEV6	-.180	.012	.108	.681	-.073
HM2	.013	-.058	.395	.419	.197
HM3	.082	-.041	-.039	-.010	.848
HM6	-.004	.103	-.016	.087	.722
Eigenvalue	1.49	1.27	1.20	1.14	1.04
% of Total Variance	4.5	3.8	3.6	3.4	3.2
Cum. % of Variance	52.1	55.9	59.6	63.0	66.2

TABLE 8

COMPARISON OF SAMPLE ONE AND TWO FACTORS

SAMPLE 1	SAMPLE 2	SAMPLE 1	SAMPLE 2
Factor 1	Factor 1	Factor 5	Factor 4
BAR10	BAR8	SUS8	SUS8
BAR8	BAR5	SUS5	SUS6
BAR5	BAR6	SUS6	CTA2
BAR7	CTA4		SUS5
BAR6	CTA1		
	BAR7	Factor 6	Factor 6
	BAR10	SUS9	SUS9
		SEV7	SEV7
Factor 2	Factor 3	SUS4	
BEN6	BEN4		
BEN4	BEN6	Factor 7	Factor 10
BEN2	BEN8	HM3	HM3
BEN9	BEN1	HM6	HM6
BEN8	SUS4	HM4	
Factor 8	Factor 8	Factor 10	Factor 5
BEN1	BEN9	HM2	HM4
BEN5	BEN2	HM1	BEN5
			HM1
Factor 4	Factor 2	Factor 3	Factor 7
SEV1	SEV4	CTA6	CTA6
SEV4	SEV1	CTA7	CTA7
SEV5	SEV5	CTA4	
		CTA2	
Factor 9	Factor 9	CTA1	
SEV6	SEV8		
SEV8	SEV6		
	HM2		

items that were found to discriminant between the two groups. All dimensions except general health motivation had at least two items that discriminated between samples. Eight of the items discriminated for the first sample (positive coefficients) and eight items discriminated for the second sample (negative coefficients). Although a statistical significance was found little information about factors or scales that could be used to effectively classify the two samples was found.

TABLE 9

DISCRIMINANT FUNCTION COEFFICIENTS

Item	Coefficient	Item	Coefficient	Item	Coefficient
BEN2	0.125	BAR7	0.212	SEV6	-0.414
BEN9	0.113	BAR10	-0.156	SEV8	0.257
BEN8	0.187	BAR8	0.695	SEV1	-0.104
BEN1	-0.104	BAR6	0.318		
BEN6	0.199				
SUS6	-0.125	CTA2	-0.238		
SUS4	-0.432	CTA4	-0.362		

Reliability and Validity

In the development of the instrument steps were taken to establish its reliability and validity. Retest and internal consistency reliability was evaluated as well as content and construct validity. It was not possible to evaluate criterion-related validity because of the lack of other instruments measuring health beliefs or similar beliefs in individuals with arthritis.

Retest reliability was determined using Pearson correlations for each of the six scales. Subjects from the first sample were asked if they would be willing to complete another questionnaire in approximately three weeks. Of the subjects who agreed and were contacted forty-three completed a second questionnaire three to six weeks after completion of the initial questionnaire. Scales for each of the six dimensions were compared. Pearson correlation coefficients ranged from 0.6425 to 1.000. All of these correlations were significant at the 0.000 level. The general health motivation scales had a correlation of 1.000 . The benefits scales had a correlation of 0.8296. The perceived susceptibility scales had a correlation of 0.8009. The correlation of the barriers scale was 0.7091. The cues to action coefficient was 0.6748 and the perceived severity scale correlation coefficient was 0.6425.

Internal consistency reliability of the scales was measured using Cronbach's alpha. Internal consistency reliability was based on the first sample of 240 subjects. Alpha coefficients ranged from 0.518 to 0.7926. The barriers scale alpha coefficient was 0.7926. The alpha coefficient for the cues to action scale was 0.737. The benefits scale alpha coefficient was 0.7151. The alpha coefficient for the perceived susceptibility scale was 0.6202. The perceived severity scale alpha coefficient was 0.6073 and the general health motivation scale alpha coefficient was 0.5180.

Moderate retest reliability was demonstrated and low to moderate internal consistency reliability was demonstrated. These reliability coefficients compare favorably with coefficients reported by others. Alpha coefficients reported by others ranged from .47 to .96 (Maiman, et al., 1977), .75 to .82 (Given, et al., 1984), .68 to .87 (Given, et al., 1983), .60 to .78 (Champion, 1984), and .81 to .97 (Fincham and Wertheimer, 1985). Retest reliability is less

frequently reported. Andreoli (1981) reported retest reliability coefficients of .59 to .71 and Champion (1984) reported retest reliability coefficients of .47 to .86.

Content validity was determined by reviewing instruments previously used to measure the dimensions of the health belief model, reviewing literature related to arthritis, and interviewing three clinical nurse specialist to develop a pool of 69 potential items to be included in the instrument. These items were then submitted to a panel of expert judges. The process used to determine content validity was described in the section on the development of the instrument. Table 5 indicates the level of interrater agreement for each of the original items.

Construct validity was determined by use of factor analysis. In the first sample all but one of the thirty-three items factored to items from the same belief. Four of the six dimensions of the Health Belief Model did result in two factors. The barriers and cues to action dimensions items loaded together on one factor each. Table 10 shows that Factor 1 included all five items included in the dimension of barriers scale.

TABLE 10

BARRIERS DIMENSION SCALE

Item	Content
BAR10	It is too inconvenient for me to do my exercises.
BAR8	I would have to change too many daily activities to include the arthritis self-management techniques I have been told about.
BAR5	The arthritis self-management techniques I am aware of are too time consuming.
BAR7	It isn't easy for me to learn the exercises for my arthritis.
BAR6	To do my joint exercises causes too much pain.

Table 11 shows the items included in Factor 3. These items reflect activities that would remind an individual with arthritis to engage in self-management activities known as the cues to action dimension scale.

TABLE 11

CUES TO ACTION DIMENSION SCALE

Item	Content
CTA6	When my arthritis begins to interfere more with my daily living than I am more consistent with taking my medications.
CTA7	I take my arthritis medication the way it is prescribed when I have more pain than usual.
CTA4	When my arthritis begins to interfere more with my daily living then I do my exercises regularly.
CTA2	Someone in my family helps me remember to take my arthritis medication regularly.
CTA1	I'd probably take care of my joints properly if I were reminded to.

Analysis of the items within each factor shows the relationships that made four of the dimensions have two factors. The scale for the dimension of benefits combines Factors 2 and 8. The five items in Factor 2 all deal with medications for arthritis or using advice about controlling arthritis from a physician. The two items in Factor 8 mention specific activities (controlling weight and exercise) to help arthritis. Table 12 shows the items for the benefits dimension scale.

TABLE 12

BENEFITS DIMENSION SCALE

Item	Content
Factor 2	
BEN6	Taking my arthritis medicine as prescribed will make me feel better .
BEN4	Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.
BEN2	Taking my arthritis medication slows down the progression of my arthritis.
BEN9	If I use the advice my physician gave me my arthritis will get better.
BEN8	If I don't use the advice my physician gave me I will end up with my arthritis getting worse.
Factor 8	
BEN1	Keeping my weight close to my ideal weight helps control my arthritis.
BEN5	Exercise helps my arthritis.

Factors 4 and 9 include the items that contain the perceived severity scale. Factor 4 contains three items that describe specific effects of arthritis. Factor 9 contains two items that compare the perceived danger of arthritis to two other illness's (flu and hypertension). Table 13 shows the items comprising the severity dimension scale.

TABLE 13

SEVERITY DIMENSION SCALE

Item	Content
Factor 4	
SEV1	My arthritis limits my daily activities.
SEV4	My arthritis keeps me from doing things I want to do
SEV5	My arthritis interferes with my going to work or school.
Factor 9	
SEV6	Having the flu is more dangerous to one's health than having arthritis.
SEV8	Having hypertension is more serious to one's health than having arthritis.

The perceived susceptibility scale combines Factors 5 and 6. Factor 5 has three items that speak to ones arthritis getting worse. Factor 6 has two items that include the idea of worrying and an item related to perceived susceptibility because of others in the family having arthritis. Table 14 shows the items that comprise the susceptibility dimension scale.

TABLE 14

SUSCEPTIBILITY DIMENSION SCALE

Item	Content
Factor 5	
SUS8	Due to the condition of my physical health my arthritis is likely to get worse.
SUS5	My chances that my arthritis will get worse are great.
SUS6	Within the next year my arthritis will get worse.
Factor 6	
SUS9	I worry alot about about my arthritis getting worse.
SEV7	It worries me to think about the effect my arthritis will have on my health.
SUS4	I have arthritis because it runs in my family.

Factors 7 and 10 combined result in the general health motivation scale. Factor 7 includes three items that describe activities (seeking information, doing things, and exercising) that an individual would engage in independently. Factor 10 includes two items about having regular physical and dental examinations. Table 15 show the health motivation dimension scale.

TABLE 15

GENERAL HEALTH MOTIVATION DIMENSION SCALE

Item	Content
Factor 7	
HM3	I search for new information related to my health.
HM6	I frequently do things to improve my overall health.
HM4	I exercise regularly - at least three times a week.
Factor 10	
HM2	I have regular dental examinations in addition to visits for a specific problem.
HM1	I have regular physical examinations in addition to visits to the doctor for my arthritis.

The results of the factor analysis indicate that the dimensions of the Health Belief Model are sufficiently distinct to be considered different beliefs. This supports the findings of Jette, Cummings, Brock, Phelps, and Naessens (1981). In reviewing the items for each of the factors it becomes clear why some items would factor together and result in two factors for the same dimension of the Health Belief Model.

Description of the Sample

Data were gathered to describe the samples used in the study. Chi-square and t-tests were used to compare the means of the two samples on the following demographic data: age, sex, marital status, racial/ethnic background, religion, type of arthritis, years since diagnosis, and family income. Data was gathered regarding occupation, spouse occupation, level of education, and

spouse level of education to calculate social status using the Hollingshead Four Factor Index of Social Status formula.

Age, Sex, Marital Status, Race, and Religion

Information on age, sex, marital status, race and religion is summarized in Table 16. The age of the subjects in sample 1 ranged from 26 to 97 (mean=61.23, standard deviation=12.78). In sample 2 the age range was 18 to 91 (mean=57.39, standard deviation=14.73). Using a T-test to compare the mean age of the two samples indicated a significant difference between the two samples resulting in a t-value of 2.71 (p=0.007).

In sample 1, 82.5% of the sample were female and 17.5% were male. In the second sample, 77.1% were female and 22.9% were male. A Chi-square analysis of the two samples indicates no significant difference between the two samples in the area of sex (Chi-square=1.51, 1 D.F., p=0.22).

A difference was noted between the two samples in the area of marital status. In sample 1, 61.3% were married, 1.7% separated, 12.5% divorced, 18.3% widowed, and 6.3% never married. In the second sample 64.2% were married, 4.0% separated, 8.7% divorced, 11.5 widowed, and 12.1% never married. An analysis of the two samples resulted in a Chi-square value of 11.19 (4 D.F., p=0.025).

TABLE 16

DEMOGRAPHICS OF SAMPLES: AGE, SEX, MARITAL STATUS, RACE, AND RELIGION

	Group 1		Group 2	
	n	%	n	%
AGE				
18-27	2	.8	3	1.7
28-37	10	4.2	20	11.5
38-47	18	7.5	21	12.2
48-57	57	23.8	27	15.5
58-67	73	30.5	52	29.9
68-77	56	23.4	45	25.9
78-87	21	8.8	5	2.9
>87	2	.8	1	.6
SEX				
male	42	17.5	40	22.9
female	198	82.5	135	77.1
MARITAL STATUS				
married	147	61.3	111	64.2
separated	4	1.7	7	4.0
divorced	30	12.5	15	8.7
widowed	44	18.3	19	11.0
never married	15	6.3	21	12.1
RACE				
Caucasian	221	92.1	155	89.1
African-American	12	5.0	12	6.9
Hispanic	0	.0	5	2.9
American Indian	2	.8	1	.6
Asian-Pacific	4	1.7	1	.6
Other	1	.4		
RELIGION				
Catholic	95	41.3	83	49.4
Protestant	110	47.8	56	33.3
Jewish	15	6.5	20	11.9
Other	10	4.3	9	5.4

In sample 1, 92.1% were Caucasian and 5.0% were African-American and in Sample 2, 89.1% were Caucasian and 6.1% were African-American. Data on race were analyzed using Caucasian and African-American categories since the percentage of Hispanic, American Indian, and Asian-Pacific individuals was small in both samples. No significant difference was noted between the two samples on the variable of race. The Chi-square value was 0.715 (1 D.F., p=0.398).

A significant difference was also noted on the variable of religion. In sample 1, 41.3% reported their religious affiliation as Catholic, 47.8% as Protestant, and 6.5% as Jewish. In sample 2, 49.4% were Catholic, 33.3% Protestant, and 11.9% Jewish. A Chi-Square analysis resulted in a value of 9.72 (3 D.F., p=0.0211)

Diagnosis and Years Since Diagnosis

Data related to diagnosis and years since diagnosis are summarized in Table 17. In sample 1, 30.3% reported a diagnosis of rheumatoid arthritis and 61.5% reported a diagnosis of osteoarthritis (8.2% reported a combination of diagnoses). In sample 2, 57.5% reported a diagnosis of rheumatoid arthritis and 31.1% reported a diagnosis of osteoarthritis (11.4% reported a combination of diagnoses). An analysis of this data using Chi-Square showed a strongly significant difference in the two samples with a Chi-Square value of 36.477 (2 D.F., p=0.000).

There was no significant difference between the two samples in years since diagnosis. In sample 1 the range was 1 year to 48 years (mean=11.05, standard deviation=10.20) and in sample 2 the range was 1 year to 40 years (mean=11.69, standard deviation=9.89). The t-value was -0.93 (p=0.355).

TABLE 17

DEMOGRAPHICS OF SAMPLES: DIAGNOSIS AND YEARS SINCE DIAGNOSIS

	Group 1		Group 2	
	n	%	n	%
DIAGNOSIS				
Rheumatoid Arthritis	70	30.3	96	57.5
Osteoarthritis	142	61.5	52	31.1
Combination	19	8.2	19	11.4
YEARS SINCE DIAGNOSIS				
1-5	95	42.2	62	36.7
6-10	39	17.3	31	18.3
11-15	32	14.2	22	13.0
16-20	24	10.7	24	14.2
21-25	12	5.3	13	7.7
26-30	9	4.0	8	4.7
31-35	4	1.8	5	3.0
36-40	7	3.1	4	2.4
>40	3	1.3		

Education, Occupation, and Social Status

Data related to level of education, occupation, spouse level of education, and spouse occupation are described in Tables 18 and 19. Categories for these variables were determined by using those outlined in Hollingshead Four Factor Index of Social Status. In addition categories of housewife, volunteer, and unable to classify were added to the subject's data. Data related to spouse occupation also included categories of housewife, no spouse, and unable to classify. Variables related to education and occupation were analyzed using the Chi-Square statistic.

No significant difference was found in any of these variables. Comparison of the two samples related to occupation of subjects resulted in a Chi-Square value of 10.431 (p=0.403, 10 D.F.). Highest level of education resulted in a Chi-Square value of 10.192 (6 D.F., p=0.117). Data related to the spouse's occupation resulted in a Chi-Square of 5.525 (10 D.F., p=0.854). The spouse's highest level of education when analyzed resulted in a Chi-Square of 9.158 (7 D.F., p=0.242).

TABLE 18
DEMOGRAPHICS OF SAMPLES: EDUCATION AND OCCUPATION

	Group 1		Group 2	
	n	%	n	%
LEVEL OF EDUCATION				
less than 7th grade	2	.8	0	0
7th-9th grade	9	3.8	16	9.6
10th-11th grade	16	6.7	15	9.0
High school graduate	69	29.0	46	27.5
1-3 years college	69	29.0	52	31.1
4 years college	38	16.0	22	13.2
Professional degree	35	14.7	16	9.6
OCCUPATION				
unskilled	7	3.0	3	1.8
semiskilled	14	6.0	7	4.2
skilled	16	6.9	18	10.8
clerical and sales	56	24.1	40	24.1
semiprofessional	33	14.2	22	13.3
managers, minor prof.	35	15.1	20	12.0
administrators	30	12.9	17	10.2
executive, major prof.	9	3.9	4	2.4
housewife	17	7.3	18	10.8
volunteer	2	.9	0	0.0
unable to classify	13	5.6	17	10.2

TABLE 19

DEMOGRAPHICS OF SAMPLES: SPOUSE EDUCATION AND OCCUPATION

	Group 1 n	%	Group 2 n	%
SPOUSE LEVEL OF EDUCATION				
less than 7th grade	3	1.4	0	0.0
7th-9th grade	7	3.2	8	5.0
10th-11th grade	10	4.6	14	8.7
High school graduate	62	28.6	40	24.8
1-3 years college	39	18.0	28	17.4
4 years college	29	13.4	14	8.7
Professional degree	28	12.9	19	11.8
No spouse	39	18.0	38	23.6
SPOUSE OCCUPATION				
unskilled	3	1.4	2	1.3
semiskilled	17	8.0	9	6.0
skilled	20	9.4	20	13.3
clerical and sales	19	9.0	8	5.3
semiprofessional	22	10.4	14	9.3
managers, minor prof.	26	12.3	16	10.7
administrators	16	7.5	10	6.7
executive, major prof.	17	8.0	11	7.3
housewife	7	3.3	9	6.0
unable to classify	18	8.5	13	8.7
no spouse	47	22.2	38	25.3

The subjects' social status was measured with the Hollingshead Four Factor Index. Social status represents the relative position of individuals or families in the class structure. Social status is determined by combining information on sex, marital status, education, and occupation. The occupational scale is weighted by five and the educational level scale is weighted by three. Calculation of the score is made by adding the weighted values for education

and occupation for each spouse employed and dividing by two. In the event that only one spouse is employed outside the home the score is determined by adding the weighted value for education and occupation of the employed spouse. Computed scores range from eight to sixty-six. The higher the score the higher the level of social status attributed to the individual or family.

The mean score for sample 1 was 51.896 (S. D.=20.952) and for sample 2 was 55.754 (S.D.=1.973). Analysis of the two samples using the t-test statistic showed no significant difference between the two samples with a t-value of -1.61 (p=0.108). The mean values of both samples indicates a heavy distribution at the higher levels of social status.

Hollingshead has identified ranges of score that are associated with five specific social strata. These strata are major business and professional (66-55), medium business, minor professional, and technical (54-40), skilled craftsmen, clerical, and sales workers (39-30), machine operators and semiskilled workers (29-20), and unskilled laborers and menial service workers (19-8). The samples were classified using these strata and the results are summarized in Table 20. A Chi-Square analysis of these categories showed no significant difference between samples (Chi-Square=5.598, 4 D.F., p=0.231).

In addition data were collected regarding reported family income. A Chi-Square analysis of the two samples using the income categories shown in Table 20 resulted in value of 6.295 (10 D.F., p=0.790) indicating no significant difference in the two samples.

TABLE 20

DEMOGRAPHICS OF SAMPLES: FAMILY INCOME AND SOCIAL STRATA

	Group 1 n	%	Group 2 n	%
FAMILY INCOME				
Less than $5,000	3	1.4	1	.7
$5,000-$9,999	22	10.3	9	6.0
$10,000-$14,999	27	12.7	19	12.6
$15,000-$19,999	22	10.3	13	8.6
$20,000-$24,999	21	9.9	11	7.3
$25,000-$29,999	19	8.9	15	9.9
$30,000-$34,999	19	8.9	16	10.6
$35,000-$39,999	12	5.6	14	9.3
$40,000-$44,999	12	5.6	12	7.9
$45,000-$49,999	9	4.2	8	5.3
More than $50,000	47	22.1	33	21.9
SOCIAL STRATA				
Unskilled laborer	3	1.3	0	0.0
Semiskilled worker	12	5.0	15	8.6
Skilled, clerical, sales	56	23.3	40	22.9
Minor professional	93	38.8	50	28.6
Major professional	45	18.8	28	16.0
Unable to classify	31	12.9	42	24.0

In summary, demographic data were collected in order to describe the two samples. Analyses of the two samples indicates the only significant differences between the two samples were in the areas of age, diagnosis, marital status, and religion. It was not anticipated that there would be significant differences between the two samples. The significant difference in age of the samples may be explained by another significant finding in the demographic data. In comparing the arthritis diagnoses of the two samples, a significant difference in diagnosis was found. Because osteoarthritis is common

as individuals age one would expect a sample that was older to have a larger percentage of subjects with osteoarthritis. Sample two was younger and had a larger percentage of subjects with rheumatoid arthritis which is a disease that is frequently diagnosed in one's forties or fifties, much earlier then osteoarthritis.

A larger percentage of subjects in the first sample reported being divorced or widowed. The subjects in sample one are older than those in sample two. The significant difference in marital status is probably related to the difference in age between the two samples. It is not surprising that an older sample would report a higher percentage of subjects being widowed (Sample 1=18.3%, Sample 2=11.5%). There is no finding that would possibly explain the significant difference in religion.

Summary

The reliability and validity for this instrument to measure health beliefs of individuals with arthritis have been investigated. Initial reliability and validity have been estimated and are similar to estimates of reliability and validity reported by other investigators using dimensions of the Health Belief Model. An analysis of the data collected to describe the two samples indicates a significant finding that needs to be considered in future development of the instrument. The difference in diagnosis between the two groups has implications for the construct validity of the instrument. Discussion of future research to strengthen the reliability and validity of this instrument is included in Chapter 5.

CHAPTER V

SUMMARY

Although the literature reports the use of the Health Belief Model as a framework used to investigate many aspects of health behaviors related to preventive and chronic illnesses, the number of studies that describe or report information on how the Health Belief Model was operationalized are few. Many studies report the use of investigator developed instruments without any evidence of evaluating the psychometric properties of the developed instrument. Those instruments that do report information about reliability or validity repeatedly surface in the literature with investigators reporting the original reliability or validity estimates without further evaluation within the subsequent research being conducted.

Only one instrument developed and reported in the literature (Champion, 1984) to date includes the minimum reliability and validity for evaluating an instrument. This study however only included five of the six dimensions of the Health Belief Model, having excluded the cues to action dimension. Minimum reliability and validity necessary to evaluate an instrument includes test-retest reliability, internal consistency reliability, at least one form of content validity, and at least one type of criterion-related or construct validity (Norbeck, 1985).

The strength of the research design used to develop this instrument to measure the health beliefs of individuals with arthritis included the evaluation of these areas of reliability and validity. In all areas of reliability and validity estimated in this research, the results are consistent with results described by

other investigators. In addition, all dimensions of the Health Belief Model were included. An additional strength of this research is the use of large samples to determine estimates for multiple assessments of reliability and validity for this instrument. This research has resulted in an instrument that will facilitate reliable and valid measurement of the health beliefs of individuals with arthritis.

The instrument described in this research includes estimates of test-retest reliability, internal consistency reliability, content validity and construct validity. Criterion-related validity has not been evaluated for any of the instruments measuring dimensions of the Health Belief Model because of the lack of a suitable alternative criterion.

Test-retest reliability coefficients of .643 to 1.00 were estimated in the development of this instrument. The health motivation dimension had a coefficient of 1.00, the benefits dimension coefficient was .83, the susceptibility coefficient was .80, the barriers dimension coefficient was .71, the cues to action dimension coefficient was .68, and the severity dimension coefficient was .64. This compares favorably with the estimates reported by others of .70 (Andreoli, 1981), .47 - .86 (Champion, 1984), and 88.6% (Cerkoney, 1980).

Internal consistency reliability estimates ranged from .52 to .79. The internal consistency reliability of the health motivation dimension scale was .52. The severity dimension scale was .61. The susceptibility dimension scale was .62. The benefits dimension scale was .72. The cues to action dimension scale coefficient was .74 and the barriers dimension scale coefficient was .79. These also compare favorably to the estimates reported by the thirteen investigators who included internal consistency coefficients in the report of their research. (See Table 1). Except for the internal consistency reliability of the health motivation dimension, all of the reliability coefficients meet the standard

suggested by Nunnally (1978) of at least .60 for instruments that are in the early stages of development.

Content validity for this instrument was established by the use of a panel of thirteen experts who had experience in conducting research that used the Health Belief Model as part of the conceptual framework for the research. The items included in the severity, barriers, benefits, and health motivation dimension scales all had interrater agreements of at least 76%. Items in the susceptibility and cues to action dimension scales had items with at least a 54% interrater agreement. Items for these two scales with slightly lower levels of interrater agreement were included because the content of the item was conceptually important to the dimension.

Construct validity of the instrument was evaluated by use of factor analysis. Both samples resulted in ten factors with items loading differently on several of the factors. Table 8 shows the comparison of the samples for each of the factors. Four of the dimension scales are represented by two factors (benefits, severity, susceptibility, and health motivation). Although the factors vary across the two samples the dimensions with the exception of cues to action remain fairly stable across the two samples. The difficulty with the cues to action dimension scale may explain why so few studies have included it. The results of the factor analysis would support beginning construct validity of this instrument.

Future development of this instrument should include further exploration of its construct validity. Because of the significant difference found in the diagnoses of the two samples and the variation of the factors in the two samples, further clarification of the possible role that diagnosis plays in a subject's response to the items needs to be undertaken. This could be done

through the use of two additional samples of 300-350 subjects. Each sample would be limited to only one diagnosis, either rheumatoid or osteoarthritis. Previous research using the Health Belief Model has supported the use of instruments that are diagnosis specific. There may be enough difference in symptoms of individuals with rheumatoid and osteoarthritis to support the use of different instruments. Further research also could investigate which if any of the dimensions are similar between the two diagnoses and whether the factors that are identified by factor analysis are more stable when the diagnosis is limited to either rheumatoid or osteoarthritis. In addition recent advances in the computer programs for confirmatory factor analysis may make further investigation of the construct validity of the instrument possible.

Future development of the instrument should be designed so that data collected from future samples would continue to examine the test-retest and internal consistency reliability.

Once the instrument is found to have consistent and acceptable levels of reliability and validity it also could be used to examine the stability of health beliefs over time in individuals with arthritis. It also could be used to investigate the relationship between health beliefs and other variables such as knowledge about the disease and functional ability at various points of time from diagnosis.

The development of a thirty-three item instrument with six subscales of five to seven items provides a tool with the potential for great usefulness in clinical research. With each item being rated on a five point Likert scale, scores for each of the subscales as well as a total scale score can be easily calculated.

Discussion of the implications for the use of the Health Belief Model in nursing research has been in the literature for nearly a decade (Mikhail, 1981; Redeker, 1988). The development of this instrument provides a means to

investigate the relationship between the dimensions of the Health Belief Model in individuals with arthritis. In addition the relationship between these dimensions and other variables such as stress, coping, and locus of control can be investigated with the use of this instrument to measure the dimensions of the Health Belief Model.

Investigations such as these are important to develop a better understanding of individuals with chronic illnesses such as arthritis. The key to maintaining independence and function in activities of daily living for individuals with arthritis is optimal management of the symptoms such as pain and prevention of joint deformity through joint protection activities and exercises to keep joints mobile. Critical to the development of meaningful and useful research is the construction of psychometrically sound instruments to measure psychosocial constructs like those included in the Health Belief Model.

Research findings that investigate the relationship between dimensions of the Health Belief Model and other variables already mentioned may provide direction for nursing interventions that can be tailored to characteristics of the individual. The future may bring the ability to use this arthritis health beliefs instrument with a client in a clinical setting. The scores for each of the subscales may indicate what specific beliefs are most important to an individual and thus may provide valuable information about which dimension for the nurse or other health care provider to focus on. Health beliefs are potentially modifiable and identification of those beliefs that could be modified to improve self-management of some component of arthritis would provide direction for the health care provider. This may provide direction for interventions that would increase the individual's adherence to recommended actions to manage the disease and its symptoms.

This instrument also could be used in experimental studies investigating the causal role of health beliefs, the conditions under which health beliefs may be altered, and the relative efficacies of different intervention strategies that could be used to increase adherence in individuals with arthritis. In addition this instrument could be used in intervention studies designed to evaluate a specific intervention with clients with particular health beliefs.

Development of diagnosis specific instruments to measure health beliefs such as the one developed in this study for individuals with arthritis will strengthen the design of future research studies that include health beliefs. Because of the many questions still unanswered about the various dimensions of the Health Belief Model and the relationships between the dimensions future research using this instrument should continue to evaluate the various estimates of reliability and validity.

APPENDIX A

INFORMATION SHEET, LETTER FROM INVESTIGATOR, LETTER FROM ARTHRITIS FOUNDATION

INFORMATION SHEET

Susan Dean-Baar, R.N. a student in the doctoral program in Curriculum and Human Resource Development at Loyola University of Chicago, is conducting a study of the health beliefs of people who have arthritis. This study is one of the requirements for the completion of her degree.

The purpose of this study is to identify beliefs that individuals with arthritis commonly have. As a participant in this study you will be asked to complete a questionnaire. This questionnaire will be used to identify those beliefs that frequently or commonly occur with people who have arthritis.

There are no known risks involved in your participating in this study. The information collected on the questionnaire will not be identified with you in any way. Your filling out and returning the questionnaire will indicate you agree to participate in this study.

Susan Dean-Baar will answer any questions you may have regarding this study, now or whenever they may occur to you. You may contact her at (312) 942-2753. If you do not choose to participate in this study, you will still receive all the medical care and information about your condition. Thank you for your consideration.

LETTER FROM INVESTIGATOR

I am requesting your assistance in a research project that I am presently conducting. Attached you will find an information sheet about this study as well as a questionnaire. I would appreciate if you would take a few minutes to complete the questionnaire. A stamped, self-addressed envelope is enclosed for your convenience in returning the completed questionnaire.

If you have any questions please do not hesitate to contact me at (312) 942-2753. I thank you for your time in assisting me in this project.

Sincerely,

Susan Dean-Baar, M.S., R.N.

Dear Friend:

The enclosed questionnaire is part of a study being conducted by Susan Dean-Barr, M.S.,R.N., a doctoral student at Loyola University of Chicago.

The Arthritis Foundation, Illinois Chapter, is assisting Ms. Dean-Barr with this effort by asking Arthritis Self-Help Course (ASHC) participants to complete this form. Please take a few minutes to fill out and return the materials in the envelope provided.

Thank you for your cooperation.

Sincerely,

Robert Osgood

Robert Osgood
Director of Public Relations

RO/cam
Enclosures

7/88

Please remember the Arthritis Foundation in your will

79 W. Monroe / Suite 510 / Chicago, Illinois 60603-4990 312/782-1367
(Outside Metropolitan Chicago Telephone 1-800-572-2397)

APPENDIX B

QUESTIONNAIRE 1

QUESTIONNAIRE 1

FOR EACH OF THE FOLLOWING STATEMENTS PLEASE CHECK THE CHOICE THAT BEST DESCRIBES YOUR BELIEF ABOUT THAT STATEMENT. PLEASE CHECK ONLY ONE CHOICE FOR EACH STATEMENT.

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1. I eat a well-balanced diet.					
2. Taking my arthritis medication slows down the progression of my arthritis.					
3. I search for new information related to my health.					
4. Having the flu is more dangerous to one's health than having arthritis.					
5. To do my exercises for my arthritis I have to take time off from work.					
6. Due to the condition of my physical health my arthritis is likely to get worse.					
7. I frequently do things to improve my overall health.					
8. When my arthritis begins to interfere more with my daily living then I am more consistent with taking my medications.					
9. I believe I really have arthritis.					
10. I have regular dental examinations in addition to visits for a specific problem.					
11. If a person has arthritis it only lasts for a brief period of time.					
12. It isn't easy for me to learn the exercises for my arthritis.					
13. My chances that my arthritis will get worse are great.					
14. I always follow medical orders because I believe they will benefit my state of health.					
15. The medicine for my arthritis makes me feel worse than I do when I don't take it.					

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
16. It is too inconvenient for me to do my exercises.					
17. Having hypertension is more serious to one's health than having arthritis.					
18. Within the next year my arthritis will get worse.					
19. My arthritis keeps me from doing things I want to do.					
20. Someone in my family helps me remember to take my arthritis medication regularly.					
21. If I use the advice my physician gave me my arthritis will get better.					
22. My arthritis will have a serious effect on my future health.					
23. I use joint protection techniques more when my joints hurt.					
24. My arthritis limits my daily activities.					
25. I would have to change too many daily activities to include the arthritis self-management techniques I have been told about.					
26. I have trouble getting my arthritis medicine prescriptions filled.					
27. In my current situation, I am highly susceptible to my arthritis fluctuating.					
28. I exercise regularly - at least three times a week.					
29. Exercise helps my arthritis.					
30. If I don't use the advice my physician gave me I will end up with my arthritis getting worse.					
31. I have family or friends that have arthritis and who live pretty normal lives.					

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
32. Keeping my weight close to my ideal weight helps control my arthritis.					
33. It is impossible for me to take care of my joints properly while at work.					
34. Doing things to protect my joints from stress slows down the progression of my arthritis.					
35. I do my exercises regularly because someone in my family encourages me to do them.					
36. To do my joint exercises causes too much pain.					
37. I have regular physical examinations in addition to visits to the doctor for my arthritis.					
38. To go to the doctor for my arthritis I have to take time off from work.					
39. Although I am concerned about my health, there are other things in my life right now that have priority over health care.					
40. My out-of-pocket expenses for my arthritis medicine is very high.					
41. I worry alot about my arthritis getting worse.					
42. The arthritis self-management techniques I am aware of are too time consuming.					
43. It worries me to think about the effect my arthritis will have on my health.					
44. I am very concerned about my health.					
45. When my arthritis begins to interfere more with my daily living, then I do my exercises regularly.					
46. Taking my arthritis medicine as prescribed will make me feel better.					
47. Going to meetings with other people who have arthritis helps me to do the things that make my arthritis more manageable.					

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
48. My arthritis interferes with my going to work or school.					
49. I'd probably take care of my joints properly if I were reminded to.					
50. Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.					
51. I worry a lot about my health.					
52. I have arthritis because I participated in a lot of sports and exercises that cause damage to my joints.					
53. I take my arthritis medication the way it is prescribed when I have more pain than usual.					
54. Using arthritis self-management techniques will make me feel better.					
55. I have arthritis because it runs in my family.					
56. I believe I will have arthritis for the rest of my life.					

THIS SECTION ASKS GENERAL QUESTIONS ABOUT YOURSELF. PLEASE RESPOND BY CHECKING THE ANSWER THAT BEST DESCRIBES YOU OR BY FILLING IN THE BLANK.

1. WHAT IS TODAY'S DATE?_____

2. WHAT IS YOU AGE?_____

3. WHAT SEX ARE YOU?

   _____FEMALE
   _____MALE

4. WHAT TYPE OF ARTHRITIS DO YOU HAVE?

   _____RHEUMATOID ARTHRITIS
   _____OSTEOARTHRITIS
   _____OTHER (PLEASE INDICATE TYPE)

   _____

5. IN WHAT YEAR WAS YOUR ARTHRITIS DIAGNOSED?_____

6. WHAT IS YOUR RACIAL/ETHNIC BACKGROUND?

   _____WHITE
   _____AFRICAN-AMERICAN
   _____AMERICAN INDIAN
   _____ASIAN-PACIFIC
   _____OTHER

7. WHAT IS YOUR CURRENT MARITAL STATUS?

   _____MARRIED
   _____SEPARATED
   _____DIVORCED
   _____WIDOWED
   _____NEVER MARRIED

8. WITH WHOM DO YOU LIVE (CHECK ALL THAT APPLY):

_____SPOUSE
_____CHILDREN
_____BROTHER/SISTER
_____FRIEND
_____PARENT
_____NO ONE
_____OTHER (PLEASE SPECIFY)

_____

9. DO YOU WORK NOW?

_____FULL TIME
_____PART TIME
_____VOLUNTEER (HOSPITAL, BABY-SIT)
_____RETIRED
_____DO NOT WORK
_____OTHER (PLEASE DESCRIBE)

_____

10. WHAT TYPE OF WORK DO YOU DO NOW, OR DID YOU DO BEFORE YOU RETIRED?

_____

11. DOES YOUR SPOUSE WORK NOW?

_____FULL TIME
_____PART TIME
_____VOLUNTEER (HOSPITAL, BABY-SIT)
_____RETIRED
_____DO NOT WORK
_____OTHER (PLEASE DESCRIBE)

_____

12. WHAT TYPE OF WORK DOES YOUR SPOUSE DO NOW, OR DID BEFORE RETIREMENT?

_____

13. WHAT IS YOUR HIGHEST LEVEL OF EDUCATION?

_____PROFESSIONAL DEGREE
_____4 YEAR COLLEGE DEGREE
_____1 - 3 YEARS OF COLLEGE
_____HIGH SCHOOL GRADUATE
_____COMPLETED 10 - 11 YEARS OF SCHOOL
_____COMPLETED 7 - 9 YEARS OF SCHOOL
_____COMPLETED LESS THAN 7 YEARS OF SCHOOL

14. WHAT IS YOU SPOUSES HIGHEST LEVEL OF EDUCATION?

_____PROFESSIONAL DEGREE
_____4 YEAR COLLEGE DEGREE
_____1 - 3 YEARS OF COLLEGE
_____HIGH SCHOOL GRADUATE
_____COMPLETED 10 - 11 YEARS OF SCHOOL
_____COMPLETED 7 - 9 YEARS OF SCHOOL
_____COMPLETED LESS THAN 7 YEARS OF SCHOOL

15. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR FAMILY INCOME?

_____LESS THAN $5,000
_____$5,000 - $9,999
_____$10,000 - $14, 999
_____$15,000 - $19,999
_____$20,000 - $24,999
_____$25,000 - $29,999
_____$30,000 - $34,999
_____$35,000 - $39,999
_____$40,000 - $44,999
_____$45,000 - $49,999
_____$50,000 OR ABOVE

16. WHAT US YOUR RELIGION?

_____CATHOLIC
_____PROTESTANT
_____JEWISH
_____OTHER (PLEASE SPECIFY)

_____

APPENDIX C

QUESTIONNAIRE 2

QUESTIONNAIRE 1

FOR EACH OF THE FOLLOWING STATEMENTS PLEASE CHECK THE CHOICE THAT BEST DESCRIBES YOUR BELIEF ABOUT THAT STATEMENT. PLEASE CHECK ONLY ONE CHOICE FOR EACH STATEMENT.

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
1. Taking my arthritis medication slows down the progression of my arthritis.					
2. I search for new information related to my health.					
3. Having the flu is more dangerous to one's health than having arthritis.					
4. Due to the condition of my physical health my arthritis is likely to get worse.					
5. I frequently do things to improve my overall health.					
6. When my arthritis begins to interfere more with my daily living then I am more consistent with taking my medications.					
7. I have regular dental examinations in addition to visits for a specific problem.					
8. It isn't easy for me to learn the exercises for my arthritis.					
9. My chances that my arthritis will get worse are great.					
10. It is too inconvenient for me to do my exercises.					
11. Having hypertension is more serious to one's health than having arthritis.					
12. Within the next year my arthritis will get worse.					
13. My arthritis keeps me from doing things I want to do.					
14. Someone in my family helps me remember to take my arthritis medication regularly.					
15. If I use the advice my physician gave me my arthritis will get better.					
16. My arthritis limits my daily activities.					

	STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE
17. I would have to change too many daily activities to include the arthritis self-management techniques I have been told about.					
18. I exercise regularly - at least three times a week.					
19. Exercise helps my arthritis.					
20. If I don't use the advice my physician gave me I will end up with my arthritis getting worse.					
21. Keeping my weight close to my ideal weight helps control my arthritis.					
22. To do my joint exercises causes too much pain.					
23. I have regular physical examinations in addition to visits to the doctor for my arthritis.					
24. I worry alot about my arthritis getting worse.					
25. The arthritis self-management techniques I am aware of are too time consuming.					
26. It worries me to think about the effect my arthritis will have on my health.					
27. When my arthritis begins to interfere more with my daily living, then I do my exercises regularly.					
28. Taking my arthritis medicine as prescribed will make me feel better.					
29. My arthritis interferes with my going to work or school.					
30. I'd probably take care of my joints properly if I were reminded to.					
31. Taking my arthritis medication keeps my joint pain in control so that I can do things I like to do.					
32. I take my arthritis medication the way it is prescribed when I have more pain than usual.					
33. I have arthritis because it runs in my family.					

THIS SECTION ASKS GENERAL QUESTIONS ABOUT YOURSELF. PLEASE RESPOND BY CHECKING THE ANSWER THAT BEST DESCRIBES YOU OR BY FILLING IN THE BLANK.

1. WHAT IS TODAY'S DATE?_____

2. WHAT IS YOU AGE?_____

3. WHAT SEX ARE YOU?

   _____FEMALE
   _____MALE

4. WHAT TYPE OF ARTHRITIS DO YOU HAVE?

   _____RHEUMATOID ARTHRITIS
   _____OSTEOARTHRITIS
   _____OTHER (PLEASE INDICATE TYPE)

   _____

5. IN WHAT YEAR WAS YOUR ARTHRITIS DIAGNOSED?_____

6. WHAT IS YOUR RACIAL/ETHNIC BACKGROUND?

   _____WHITE
   _____AFRICAN-AMERICAN
   _____AMERICAN INDIAN
   _____ASIAN-PACIFIC
   _____OTHER

7. WHAT IS YOUR CURRENT MARITAL STATUS?

   _____MARRIED
   _____SEPARATED
   _____DIVORCED
   _____WIDOWED
   _____NEVER MARRIED

8. WITH WHOM DO YOU LIVE (CHECK ALL THAT APPLY):

_____SPOUSE
_____CHILDREN
_____BROTHER/SISTER
_____FRIEND
_____PARENT
_____NO ONE
_____OTHER (PLEASE SPECIFY)

_____

9. DO YOU WORK NOW?

_____FULL TIME
_____PART TIME
_____VOLUNTEER (HOSPITAL, BABY-SIT)
_____RETIRED
_____DO NOT WORK
_____OTHER (PLEASE DESCRIBE)

_____

10. WHAT TYPE OF WORK DO YOU DO NOW, OR DID YOU DO BEFORE YOU RETIRED?

_____

11. DOES YOUR SPOUSE WORK NOW?

_____FULL TIME
_____PART TIME
_____VOLUNTEER (HOSPITAL, BABY-SIT)
_____RETIRED
_____DO NOT WORK
_____OTHER (PLEASE DESCRIBE)

_____

12. WHAT TYPE OF WORK DOES YOUR SPOUSE DO NOW, OR DID BEFORE RETIREMENT?

_____

13. WHAT IS YOUR HIGHEST LEVEL OF EDUCATION?

_____PROFESSIONAL DEGREE
_____4 YEAR COLLEGE DEGREE
_____1 - 3 YEARS OF COLLEGE
_____HIGH SCHOOL GRADUATE
_____COMPLETED 10 - 11 YEARS OF SCHOOL
_____COMPLETED 7 - 9 YEARS OF SCHOOL
_____COMPLETED LESS THAN 7 YEARS OF SCHOOL

14. WHAT IS YOU SPOUSES HIGHEST LEVEL OF EDUCATION?

_____PROFESSIONAL DEGREE
_____4 YEAR COLLEGE DEGREE
_____1 - 3 YEARS OF COLLEGE
_____HIGH SCHOOL GRADUATE
_____COMPLETED 10 - 11 YEARS OF SCHOOL
_____COMPLETED 7 - 9 YEARS OF SCHOOL
_____COMPLETED LESS THAN 7 YEARS OF SCHOOL

15. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR FAMILY INCOME?

_____LESS THAN $5,000
_____$5,000 - $9,999
_____$10,000 - $14, 999
_____$15,000 - $19,999
_____$20,000 - $24,999
_____$25,000 - $29,999
_____$30,000 - $34,999
_____$35,000 - $39,999
_____$40,000 - $44,999
_____$45,000 - $49,999
_____$50,000 OR ABOVE

16. WHAT US YOUR RELIGION?

_____CATHOLIC
_____PROTESTANT
_____JEWISH
_____OTHER (PLEASE SPECIFY)

_____

APPENDIX D

FACTOR ANALYSES TABLES

TABLE 21

RESULTS OF VARIMAX ROTATION ON 56 ITEMS - SAMPLE 1

Item	Factors and Sorted Loadings				
	1	2	3	4	5
HM 7	.786	-.115	.050	.011	-.057
SUS9	.777	.084	.288	-.023	-.004
HM5	.740	.195	-.012	-.071	.010
SEV7	.726	.203	.272	.018	-.021
BAR4	.322	-.066	-.013	.283	.301
BAR10	-.017	.696	.212	.083	.067
BAR8	.122	.694	.116	.132	.207
BAR6	.077	.660	.013	-.009	.089
BAR5	.241	.566	.037	.056	.204
CTA5	-.006	.563	.048	.024	.017
BAR7	.081	.537	.294	-.050	-.008
SUS1	.238	.303	.208	-.043	.090
SUS8	-.012	.090	.719	.157	.039
SUS6	.091	.158	.688	-.151	.174
SEV2	.374	.132	.675	-.027	.032
SUS5	.161	.098	.663	-.165	-.084
BEN6	.030	.002	-.129	.727	.083
BEN2	-.019	.087	-.055	.684	.260
BEN4	-.109	.077	-.162	.644	.206
BEN8	.118	-.069	.178	.594	-.131
BEN9	-.157	.249	.077	.545	-.020
CTA2	-.014	.133	.036	.104	.760
BAR11	.044	.124	.103	.030	.723
BAR1	-.104	.121	-.017	.215	.682
Eigenvalue	7.90	4.92	3.51	2.16	1.99
% of Total Variance	14.1	8.8	6.3	3.9	3.6
Cum. % of Variance	14.1	22.9	29.2	33.0	36.6

Table 21 - Continued.

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR3	-.033	.071	.019	.147	.123
BAR9	.182	.215	.083	-.032	.036
BAR2	-.064	.134	.213	.008	.121
SEV5	.344	.221	-.040	-.105	.181
BEN1	.167	-.104	.075	.095	-.058
BEN5	-.073	-.187	-.094	.124	.111
SEV3	-.160	.131	-.051	.134	.054
SEV1	.235	.118	.181	-.072	.031
SEV4	.161	.080	.246	-.034	.053
CTA6	-.080	.080	.119	.002	.386
CTA4	.217	.112	.121	.144	.090
CTA7	.073	.063	.083	.141	.373
BEN3	.058	.015	-.087	.298	-.012
HM6	-.097	-.053	-.079	.140	-.008
HM3	.123	.061	.018	.127	.011
HM4	-.064	-.294	-.018	-.000	.196
HM8	-.128	-.024	-.007	.084	-.065
SUS4	.003	.067	.170	.072	-.064
SUS3	.131	.194	-.130	-.024	.184
CTA1	.194	.271	.138	.126	.200
SEV8	-.052	-.060	.023	.036	.089
SEV6	-.050	-.018	-.086	.081	.002
CTA8	.100	-.035	-.076	.178	-.021
BEN7	-.070	-.095	.005	.266	-.042
SUS7	.201	.137	.377	-.084	.101
HM1	-.045	.010	-.021	.092	-.139
HM2	-.057	.037	.079	.002	.115
SEV9	-.066	.119	.090	.123	.238
SUS2	.120	-.037	.164	.131	.178
CTA3	.079	.153	.006	-.045	.317
HM9	-.013	.200	.038	-.161	.129
BEN10	.065	-.067	.111	.169	-.120

Table 21 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
HM 7	-.008	-.033	-.055	.002	.105
SUS9	.071	.006	.179	.035	-.129
HM5	.053	.059	.138	.101	.029
SEV7	.058	.038	.271	-.002	-.102
BAR4	.285	-.096	.146	-.118	-.074
BAR10	.102	-.249	-.046	-.038	-.054
BAR8	.184	-.061	.081	-.000	-.038
BAR6	.183	-.072	.151	.102	-.125
BAR5	.192	-.176	-.112	.072	-.141
CTA5	-.100	.301	.101	.248	.138
BAR7	.245	.001	.120	-.074	.122
SUS1	.244	.222	.102	.177	.298
SUS8	.091	.037	.128	.091	-.099
SUS6	.197	-.057	.248	-.047	-.047
SEV2	.042	.049	.079	.006	-.013
SUS5	.009	-.050	.069	.165	.075
BEN6	-.009	.142	.052	.092	.097
BEN2	.078	-.057	-.033	.050	.024
BEN4	-.081	.122	-.088	.172	.010
BEN8	.066	.263	-.049	-.017	.183
BEN9	.098	.106	-.208	-.012	.155
CTA2	.090	.123	.070	.160	-.014
BAR11	.118	-.041	.024	.076	-.001
BAR1	.165	-.001	.010	.142	.107
BAR3	.757	-.048	.036	.017	.057
BAR9	.745	-.063	.107	.198	-.064
BAR2	.677	.023	-.003	.136	-.042
SEV5	.589	.003	.286	-.134	-.068
Eigenvalue	1.77				
% of Total Variance	3.2				
Cum. % of Variance	39.7				

Table 21 - Continued

Item	Factors and Sorted Loadings				
	6	7	8	9	10
BEN1	.007	.732	.024	.036	-.032
BEN5	-.100	.661	-.080	.022	.141
SEV3	-.027	.491	-.263	-.196	.026
SEV1	.108	-.017	.813	.004	.057
SEV4	.118	-.070	.812	.014	-.066
CTA6	.173	-.032	.013	.627	.045
CTA4	.114	.132	.049	.576	-.034
CTA7	.135	-.168	-.153	.535	.072
BEN3	.040	.324	.214	.422	.104
HM6	-.046	.031	.011	.228	.724
HM3	-.043	.015	-.122	-.111	.666
HM4	.073	.320	.064	-.086	.561
HM8	-.109	-.064	.122	-.035	.482
SUS4	-.016	-.020	-.019	.129	.028
SUS3	.155	-.055	.044	.015	.054
CTA1	.162	-.073	-.027	.303	-.062
SEV8	-.063	.056	-.011	-.041	-.019
SEV6	.108	-.053	.078	.129	.101
CTA8	.013	-.043	.028	.027	.026
BEN7	.008	.360	-.063	.173	.129
SUS7	.015	-.094	.004	.032	.096
HM1	.023	.085	.071	.108	.112
HM2	-.026	.057	-.134	-.113	.113
Eigenvalue		1.76	1.65	1.46	1.41
% of Total Variance		3.1	3.0	2.6	2.5
Cum. % of Variance		42.9	45.8	48.4	51.0

Table 21 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
SEV9	.014	-.070	-.090	.274	-.003
SUS2	.038	-.085	.202	.080	.034
CTA3	.274	.222	.052	.086	-.064
HM9	.050	-.021	.020	.241	.047
BEN10	.027	.118	-.044	-.063	.086
	11	12	13	14	15
HM 7	-.108	.030	.054	-.020	.041
SUS9	.088	-.076	.046	.008	-.067
HM5	.030	.102	-.058	.041	-.114
SEV7	.120	-.054	-.016	-.002	-.002
BAR4	.086	-.062	-.046	.119	-.008
BAR10	-.016	.052	-.032	-.024	.118
BAR8	.113	-.058	-.109	-.165	-.024
BAR6	.003	-.126	.121	.090	.031
BAR5	.296	.091	-.054	.077	.055
CTA5	.067	.037	.074	.068	-.142
BAR7	.122	-.070	-.161	.109	.246
SUS1	.041	.074	.131	-.273	-.041
SUS8	.088	-.167	-.055	-.122	.040
SUS6	.000	.062	-.046	.107	.031
SEV2	-.087	-.013	-.084	-.027	.019
SUS5	.096	.037	.129	.088	-.121
BEN6	.167	.173	.078	.120	-.127
BEN2	-.055	-.152	.118	-.041	.195
BEN4	.090	.091	.058	.122	-.071
BEN8	-.110	.216	.053	.069	.073
BEN9	-.006	-.025	.132	-.175	-.074
CTA2	.143	.009	.049	-.035	.033
BAR11	-.281	.053	-.029	.075	.141
BAR1	.170	.074	-.022	-.090	-.128
BAR3	.113	-.050	.052	-.035	-.043
BAR9	-.092	.170	-.025	-.036	-.021
BAR2	.048	-.032	-.088	.025	.081
SEV5	.060	-.013	.217	.013	.004

Table 21 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
BEN1	-.091	-.058	-.167	.123	-.052
BEN5	-.040	-.023	.211	-.007	.081
SEV3	.142	.326	.006	-.010	.095
SEV1	-.048	.030	.034	-.068	-.043
SEV4	.052	.024	-.028	.006	-.097
CTA6	.072	-.068	.020	-.085	.041
CTA4	.219	.041	.064	.114	.229
CTA7	.122	.189	-.013	-.034	-.062
BEN3	-.095	.071	.245	.037	-.019
HM6	-.062	.121	-.004	.109	.069
HM3	.018	-.076	.041	.133	-.262
HM4	.109	.014	.286	-.026	.093
HM8	.149	.123	-.037	.306	.369
SUS4	.665	-.033	.101	.052	-.16
SUS3	.652	.143	-.009	-.045	.161
CTA1	.366	-.101	.160	-.080	.160
SEV8	-.081	.801	.103	.169	-.033
SEV6	.122	.760	-.009	-.125	.056
CTA8	.035	.069	.811	-.045	.102
BEN7	.101	.012	.547	.094	-.087
SUS7	.112	.083	.439	.262	-.234
HM1	.033	.021	.037	.731	.023
HM2	-.022	.029	.005	.662	-.086
Eigenvalue	1.32	1.29	1.23	1.17	
% of Total Variance	2.4	2.3	2.2	2.1	
Cum. % of Variance	53.3	55.6	57.8	59.9	

Table 21 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
SEV9	-.023	.093	.154	-.130	.600
SUS2	.102	.072	.063	.013	-.564
CTA3	.306	.023	-.073	.090	.370
HM9	.162	-.000	.051	.051	.065
BEN10	-.066	.110	.004	.159	-.081

	16	17
HM 7	-.096	.022
SUS9	.038	-.032
HM5	-.011	.056
SEV7	.108	-.022
BAR4	.261	.109
BAR10	.021	-.168
BAR8	.006	-.089
BAR6	.099	.147
BAR5	.087	-.109
CTA5	.116	.073
BAR7	-.030	-.023
SUS1	-.181	.133
SUS8	.176	.063
SUS6	-.065	-.053
SEV2	.104	.031
SUS5	-.162	.084
BEN6	-.156	.046
BEN2	-.084	-.018
BEN4	-.257	.165
BEN8	.298	.045
BEN9	.304	.104

Eigenvalue	1.14
% of Total Variance	2.0
Cum. % of Variance	62.0

Table 21 - Continued.

Item	Factors and Sorted Loadings	
	16	17
CTA2	-.026	.126
BAR11	.077	-.169
BAR1	.073	-.129
BAR3	.088	-.087
BAR9	.020	.012
BAR2	-.055	.058
SEV5	.058	.106
BEN1	-.030	.018
BEN5	-.031	.127
SEV3	.122	.024
SEV1	.020	.026
SEV4	-.004	-.051
CTA6	.059	.174
CTA4	.162	-.131
CTA7	.041	-.228
BEN3	.107	-.166
HM6	.020	.168
HM3	.179	-.102
HM4	-.114	-.086
HM8	-.229	.254
SUS4	-.040	-.132
SUS3	.251	.134
CTA1	.175	.073
SEV8	.053	-.012
SEV6	-.079	.120
CTA8	.113	.037
BEN7	-.189	-.126
SUS7	.011	.106

Table 21 - Continued.

Item	Factors and Sorted Loadings	
	16	17
HM1	.175	-.106
HM2	-.152	.178
SEV9	.092	.105
SUS2	-.044	.286
CTA3	.024	-.160
HM9	.722	.018
BEN10	.043	.780
Eigenvalue	1.09	1.05
% of Total Variance	1.9	1.9
Cum. % of Variance	63.9	65.8

TABLE 22

RESULTS OF VARIMAX ROTATION ON 53 ITEMS - SAMPLE 1

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR10	.755	-.032	.050	.184	.016
BAR8	.700	.131	.118	.093	.220
BAR6	.628	.073	.019	.005	.066
BAR5	.603	.254	.025	.028	.229
BAR7	.598	.086	-.079	.284	-.032
CTA5	.409	-.010	.133	.063	.070
SUS9	.096	.781	-.023	.280	-.020
HM7	-.111	.771	.016	.047	-.088
HM5	.111	.766	-.023	-.001	.080
SEV7	.227	.740	.003	.263	-.029
BEN6	-.001	.044	.719	-.140	.144
BEN2	.129	-.009	.655	-.059	.270
BEN4	.082	-.123	.624	-.177	.214
BEN8	-.067	.116	.619	.176	-.145
BEN9	.214	-.144	.566	.061	.019
BEN3	-.100	.036	.413	-.029	.018
SUS8	.091	.011	.165	.747	.082
SEV2	.134	.376	-.012	.680	.015
SUS5	.051	.153	-.128	.678	-.053
SUS6	.232	.087	-.193	.670	.113
CTA2	.116	.014	.105	.049	.787
BAR1	.082	-.085	.224	.016	.767
BAR11	.206	.023	-.030	.080	.599
Eigenvalue	7.38	4.89	3.43	2.12	1.98
% of Total Variance	13.9	9.2	6.5	4.0	3.7
Cum. % of Variance	13.9	23.1	29.6	33.6	37.3

Table 22 - Continued.

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR3	.051	-.017	.180	.057	.205
BAR9	.210	.166	.005	.065	-.010
BAR2	.197	-.059	-.026	.181	.081
SEV5	.249	.352	-.124	-.040	.168
SEV1	.128	.247	-.086	.175	-.002
SEV4	.098	.195	-.051	.232	.050
CTA6	.068	-.087	.013	.068	.304
CTA4	.155	.220	.147	.081	.008
CTA7	.039	.062	.166	.070	.368
SEV9	.187	-.049	.108	.073	.163
BEN1	-.147	.174	.128	.098	-.041
BEN5	-.215	-.067	.135	-.103	.097
SEV3	.205	-.164	.087	-.091	-.004
SEV8	-.032	-.068	.018	.016	.049
SEV6	-.063	-.032	.127	-.065	.068
CTA8	-.048	.108	.190	-.063	-.004
BEN7	-.118	-.090	.284	-.003	-.040
SUS7	.114	.186	-.085	.358	.091
HM9	.175	.002	-.128	.053	.114
CTA1	.235	.231	.160	.166	.285
HM8	-.002	-.112	.075	.002	-.046
HM6	-.139	-.115	.194	-.052	.019
HM4	-.306	-.045	-.003	-.012	.238
SUS4	.107	.023	.029	.124	-.016
SUS3	.259	.176	-.073	-.148	.223
HM3	.052	.010	.103	-.021	.009
HM1	-.040	-.024	.136	-.002	.096
HM2	.049	-.062	-.030	.062	.090
BEN10	-.098	.063	.173	.094	-.139
SUS2	-.109	.110	.141	.161	.224

Table 22 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
BAR10	.073	-.036	.069	-.205	.048
BAR8	.166	.108	.033	-.038	-.064
BAR6	.148	.189	.108	-.085	-.141
BAR5	.182	-.131	.089	-.134	.103
BAR7	.235	.087	.006	.060	-.071
CTA5	-.136	.206	.107	.236	.018
SUS9	.065	.170	.054	-.024	-.067
HM7	-.012	-.052	.046	-.039	.029
HM5	.062	.170	-.006	.037	-.063
SEV7	.060	.237	.017	.036	-.045
BEN6	-.003	.062	.038	.124	.167
BEN2	.080	-.090	.082	-.049	-.161
BEN4	-.106	-.044	.179	.121	.081
BEN8	.072	-.089	-.003	.219	.214
BEN9	.113	-.192	-.024	.089	-.036
BEN3	.002	.278	.239	.243	.070
SUS8	.095	.079	.019	.029	-.159
SEV2	.036	.066	.022	.030	-.011
SUS5	-.010	.124	.094	-.063	.036
SUS6	.185	.227	.068	-.040	.068
CTA2	.087	.067	.164	.109	.008
BAR1	.163	.016	.062	-.023	.090
BAR11	.100	.007	.285	-.001	.061
BAR3	.761	.027	-.077	-.084	-.040
BAR9	.718	.162	.251	-.092	.157
BAR2	.677	.004	.251	.079	-.038
SEV5	.586	.269	-.075	.013	-.007
Eigenvalue	1.77				
% of Total Variance	3.3				
Cum. % of Variance	40.7				

Table 22 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
SEV1	.112	.804	.024	-.010	.026
SEV4	.135	.784	.006	-.083	.021
CTA6	.151	.086	.740	-.018	-.091
CTA4	.102	.050	.671	.152	.037
CTA7	.113	-.093	.536	-.182	.191
SEV9	.021	-.185	.406	-.004	.072
BEN1	.011	.057	-.029	.733	-.055
BEN5	-.087	-.064	.064	.686	-.033
SEV3	-.024	-.270	-.032	.539	.333
SEV8	-.064	-.008	.016	.077	.807
SEV6	.115	.080	.031	-.064	.745
CTA8	.027	-.002	.004	-.029	.067
BEN7	-.007	.005	.167	.362	.012
SUS7	.002	.056	.066	-.103	.089
HM9	.058	-.012	.219	-.032	.020
CTA1	.164	-.074	.191	-.078	-.099
HM8	-.093	.047	-.027	-.018	.109
HM6	-.052	.051	.158	.051	.110
HM4	.109	.042	-.065	.357	.017
SUS4	-.005	-.014	.147	-.006	-.017
SUS3	.181	-.044	.063	-.013	.161
HM3	-.033	-.057	-.016	.037	-.063
Eigenvalue		1.71	1.55	1.45	1.36
% of Total Variance		3.2	2.9	2.8	2.6
Cum. % of Variance		43.9	46.9	49.6	52.2

Table 22 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
HM1	.040	.031	-.008	.052	.024
HM2	-.025	-.124	-.060	.075	.028
BEN10	.028	-.025	-.031	.116	.088
SUS2	.022	.308	.005	-.139	.077
	11	12	13	14	15
BAR10	-.003	-.018	-.033	-.041	.037
BAR8	-.106	.035	-.072	.096	.025
BAR6	.129	.174	-.069	-.021	-.086
BAR5	-.051	.128	-.034	.240	-.120
BAR7	-.125	.016	.261	.042	.032
CTA5	.047	.309	-.057	.132	.139
SUS9	.046	.014	-.151	.059	-.037
HM7	.070	-.133	.046	-.121	.121
HM5	.019	.089	-.038	.126	.033
SEV7	-.014	.091	-.065	.063	-.060
BEN6	.060	-.163	.061	.211	.067
BEN2	.125	-.110	.137	-.124	-.085
BEN4	.059	-.258	.046	.148	-.006
BEN8	.047	.211	.043	-.180	.167
BEN9	.112	.264	-.065	-.026	.233
BEN3	.230	.217	-.041	-.011	.053
SUS8	-.068	.206	-.003	.066	-.149
SEV2	-.082	.084	-.047	-.121	.022
SUS5	.122	-.072	.035	.204	.067
SUS6	-.028	-.124	-.002	-.044	-.013
CTA2	.050	.062	.054	.015	-.082
BAR1	-.041	.134	-.026	.115	.072
BAR11	-.004	-.070	-.052	-.412	.046
BAR3	.050	.145	-.011	.084	.027
BAR9	-.026	.021	-.131	-.090	-.002
BAR2	-.085	-.091	.039	.034	-.055
SEV5	.229	.058	-.025	-.032	-.063
SEV1	.041	.009	.079	-.072	.022
SEV4	-.036	-.017	-.004	.028	-.074

Table 22 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
CTA6	.016	.093	.016	.060	.042
CTA4	.073	.174	.054	.161	-.048
CTA7	-.028	.064	-.085	.154	.110
SEV9	.186	.152	.371	-.214	-.264
BEN1	-.188	-.022	-.062	-.026	-.035
BEN5	.199	-.010	.104	-.055	.040
SEV3	.027	.043	-.007	.047	.088
SEV8	.104	-.026	-.033	-.095	.012
SEV6	-.018	.046	.214	.114	-.067
CTA8	.810	.127	.062	.011	-.02
BEN7	.540	-.179	-.024	.221	.153
SUS7	.430	-.008	-.095	.160	.195
HM9	.046	.738	-.046	.019	.080
CTA1	.147	.350	.125	.284	-.219
HM8	-.000	-.091	.733	.050	.099
HM6	.003	.116	.517	-.026	.484
HM4	.289	-.066	.398	.056	.357
SUS4	.088	.002	-.021	.690	.068
SUS3	.008	.343	.245	.445	-.075
HM3	.047	.043	.092	.046	.809
Eigenvalue	1.30	1.25	1.16	1.14	1.12
% of Total Variance	2.4	2.4	2.2	2.1	2.1
Cum. % of Variance	54.6	57.0	59.2	61.3	63.4

Table 22 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
HM1	.006	.227	.136	.026	.005
HM2	.003	-.191	.103	-.009	.118
BEN10	.001	.037	.149	-.075	.028
SUS2	.033	-.073	-.252	.236	.210

	16	17
BAR10	-.068	-.117
BAR8	-.151	-.051
BAR6	.107	.154
BAR5	.089	-.119
BAR7	.051	-.060
CTA5	.165	.066
SUS9	.020	.010
HM7	-.033	.027
HM5	-.055	.040
SEV7	.002	-.010
BEN6	.117	.089
BEN2	-.034	-.057
BEN4	.096	.194
BEN8	.076	.067
BEN9	-.170	.178
BEN3	.099	-.244
SUS8	-.099	.015
SEV2	-.012	.045
SUS5	.101	.083
SUS6	.073	-.005
CTA2	-.016	.123
BAR1	-.016	-.142
BAR11	.066	-.145
BAR3	.011	-.106
BAR9	-.007	.044
BAR2	-.006	.063
SEV5	.019	.109

Table 22 - Continued.

Item	Factors and Sorted Loadings	
	16	17
SEV1	-.095	.028
SEV4	-.006	-.014
CTA6	-.107	.195
CTA4	.053	-.131
CTA7	.004	-.210
SEV9	-.164	-.039
BEN1	.144	-.018
BEN5	.013	.083
SEV3	-.081	.094
SEV8	.152	.023
SEV6	-.106	.059
CTA8	-.057	.010
BEN7	.078	-.092
SUS7	.281	.190
HM9	.053	-.003
CTA1	-.023	-.039
HM8	.248	.113
HM6	.101	.059
HM4	-.032	-.135
SUS4	.039	-.057
SUS3	-.089	.100
HM3	.074	.043
HM1	.791	-.066
HM2	.642	.234
BEN10	.132	.788
SUS2	.038	.413
Eigenvalue	1.09	1.01
% of Total Variance	2.1	1.9
Cum. % of Variance	65.5	67.4

TABLE 23

RESULTS OF VARIMAX ROTATION ON 51 ITEMS - SAMPLE 1

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR10	.747	-.032	.018	.181	.070
BAR8	.704	.124	.232	.094	.106
BAR6	.639	.075	.050	.008	.014
BAR5	.607	.253	.239	.012	.013
BAR7	.605	.083	-.029	.300	-.079
CTA5	.422	-.009	.079	.064	.114
SUS9	.100	.779	-.022	.273	-.015
HM7	-.108	.779	-.095	.038	.024
HM5	.135	.768	.086	.002	-.058
SEV7	.225	.732	-.025	.262	.019
BAR1	.087	-.084	.795	.007	.175
CTA2	.132	.013	.775	.052	.049
BAR11	.175	.020	.579	.068	-.000
SUS8	.097	.004	.099	.759	.179
SUS5	.076	.177	-.059	.683	-.172
SEV2	.127	.377	.005	.674	.041
SUS6	.222	.084	.091	.669	-.170
BEN8	-.104	.107	-.121	.135	.725
BEN6	-.004	.043	.192	-.176	.659
BEN9	.202	-,147	.033	.041	.634
BEN2	.127	-.011	.318	-.069	.614
BEN4	.104	-.114	.246	-.200	.521
Eigenvalue	7.23	4.74	3.28	2.06	1.98
% of Total Variance	14.2	9.3	6.4	4.0	3.9
Cum. % of Variance	14.2	23.5	29.9	34.0	37.8

Table 23 - Continued.

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR3	.058	-.017	.240	.065	.165
BAR9	.202	.168	-.011	.054	.031
BAR2	.194	-.060	.072	.177	-.016
SEV5	.257	.344	.146	-.033	-.121
SEV1	.112	.235	-.006	.155	-.064
SEV4	.079	.178	.055	.215	-.043
CTA6	.080	-.089	.284	.072	-.021
CTA4	.148	.210	.028	.077	.133
CTA7	.034	.069	.396	.055	.130
SEV9	.170	-.052	.154	.080	.149
BEN1	-.141	.178	-.019	.089	.106
BEN5	-.214	-.068	.090	-.101	.125
SEV3	.195	-.174	-.022	-.090	.128
SEV8	-.041	-.066	.042	.020	.015
SEV6	-.052	-.026	.086	-.068	.096
HM8	.012	-.098	-.040	-.004	.047
HM6	-.119	-.096	.041	-.055	.165
HM4	-.304	-.044	.243	-.005	-.027
HM9	.164	-.001	.104	.054	-.041
CTA1	.261	.228	.308	.179	.118
CTA8	-.038	.115	-.009	-.049	.166
BEN7	-.098	-.072	-.011	.005	.180
SUS4	.094	.020	-.008	.096	.030
SUS3	.268	.165	.216	-.140	-.065
HM1	-.058	-.025	-.078	-.018	.159
HM2	.071	-.062	.073	.082	-.086
HM3	.052	.099	-.013	-.022	.128
BEN10	-.071	.072	-.193	.087	.198
SUS2	-.066	.128	.223	.163	.043

Table 23 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
BAR10	.076	-.026	.073	-.210	.055
BAR8	.162	.106	.033	-.039	-.060
BAR6	.151	.166	.116	-.076	-.135
BAR5	.183	-.129	.084	-.126	.104
BAR7	.235	.083	-.005	.055	-.067
CTA5	-.142	.175	.117	.236	.020
SUS9	.064	.185	.056	-.027	-.063
HM7	-.003	-.047	.043	-.032	.027
HM5	.064	.136	-.015	.046	-.065
SEV7	.052	.263	.019	.028	-.041
BAR1	.156	.007	.069	-.015	.082
CTA2	.085	.053	.173	.122	.012
BAR11	.102	.063	.303	.000	.062
SUS8	.075	.088	.029	.016	-.151
SUS5	.006	.061	.085	-.060	.043
SEV2	.036	.089	.026	.032	-.009
SUS6	.185	.257	.075	-.050	.080
BEN8	.053	.009	.031	.222	.199
BEN6	-.015	.075	.063	.137	.157
BEN9	.099	-.156	-.002	.091	-.040
BEN2	.066	-.074	.095	-.059	-.162
BEN4	-.102	-.088	.189	.142	.076
BAR3	.749	.014	-.080	-.093	-.043
BAR9	.727	.164	.242	-.085	.148
BAR2	.686	.011	.238	.089	-.043
SEV5	.583	.276	-.075	.006	.003
Eigenvalue	1.75				
% of Total Variance	3.4				
Cum. % of Variance	41.3				

Table 23 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
SEV1	.107	.841	.032	-.010	.015
SEV4	.122	.829	.017	-.093	.015
CTA6	.154	.067	.743	-.014	-.085
CTA4	.091	.082	.682	.140	.041
CTA7	.114	-.096	.541	-.181	.184
SEV9	.018	-.129	.411	-.008	.071
BEN1	.019	.033	-.042	.752	-.072
BEN5	-.088	-.054	.069	.684	-.029
SEV3	-.026	-.233	-.025	.535	.344
SEV8	-.067	-.001	.029	.059	.820
SEV6	.118	.053	.021	-.056	.734
HM8	-.078	.023	-.051	-.003	.090
HM6	-.044	-.001	.149	.066	.090
HM4	.103	.057	-.064	.337	.022
HM9	.052	.003	.219	-.032	.010
CTA1	.152	-.094	.188	-.084	-.092
CTA8	.011	.007	.036	-.065	.097
BEN7	-.009	-.042	.180	.335	.032
SUS4	-.004	.027	.147	-.004	-.019
SUS3	.178	-.034	.042	-.013	.159
HM1	.029	.070	.009	.050	.015
HM2	-.028	-.154	-.052	.058	.056
HM3	-.042	-.051	-.001	.019	-.052
Eigenvalue		1.68	1.52	1.46	1.35
% of Total Variance		3.3	3.0	2.9	2.6
Cum. % of Variance		44.6	47.5	50.4	53.0

Table 23 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
BEN10	.043	-.063	-.033	.152	.086
SUS2	.032	.193	-.004	-.132	.083
	11	12	13	14	15
BAR10	-.039	-.026	-.042	-.036	-.07
BAR8	-.086	.023	-.092	.092	-.147
BAR6	-.056	.164	.105	-.045	.093
BAR5	-.048	.125	-.068	.235	.076
BAR7	.235	.024	-.091	.034	.052
CTA5	-.042	.266	.070	.134	.159
SUS9	-.161	.017	.022	.067	.028
HM7	.068	-.121	.032	-.122	-.050
HM5	-.035	.084	.038	.106	-.072
SEV7	-.101	.092	-.003	.076	.028
BAR1	-.018	.102	-.033	.126	-.029
CTA2	.058	.068	.070	-.031	-.015
BAR11	-.054	-.046	-.084	-.398	.067
SUS8	-.060	.171	.008	.079	-.052
SUS5	.085	-.084	.085	.182	.055
SEV2	-.049	.085	-.116	-.114	-.009
SUS6	-.019	-.095	-.062	-.053	.086
BEN8	.047	.165	.028	-.101	.115
BEN6	.088	-.237	.104	.251	.126
BEN9	-.042	.223	.109	-.005	-.143
BEN2	.113	-.181	.173	-.083	.002
BEN4	.102	-.329	.088	.148	.076
BAR3	-.034	.113	.101	.100	.021
BAR9	-.106	.027	-.078	-.077	-.027
BAR2	.051	-.065	-.104	.026	-.020
SEV5	-.052	.093	.229	-.078	.037
SEV1	.069	.020	.019	-.047	-.090
SEV4	-.036	-.014	-.034	.065	.024

Table 23 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
CTA6	.027	.111	.041	.023	-.094
CTA4	.004	.154	.125	.197	.088
CTA7	-.066	.034	-.052	.194	-.014
SEV9	.327	.171	.180	-.201	-.139
BEN1	-.030	-.065	-.181	.011	.103
BEN5	.103	-.011	.225	-.064	.025
SEV3	-.015	.069	.040	.023	-.056
SEV8	-.035	-.024	.100	-.098	.175
SEV6	.233	.035	.007	.110	-.123
HM8	.787	-.084	-.018	.047	.206
HM6	.592	.085	.023	-.016	.052
HM4	.383	-.048	.329	.047	-.019
HM9	-.047	.745	.004	.031	.052
CTA1	.067	.321	.223	.266	.001
CTA8	.013	.105	.837	-.014	-.010
BEN7	-.015	-.243	.578	.229	.078
SUS4	-.005	.022	.039	.711	.033
SUS3	.223	.391	.032	.409	-.069
HM1	.137	.192	-.016	.090	.801
HM2	.106	-.177	.045	-.071	.681
Eigenvalue	1.28	1.21	1.15	1.13	1.08
% of Total Variance	2.5	2.4	2.3	2.2	2.1
Cum. % of Variance	55.6	57.9	60.2	62.4	64.5

Table 23 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
HM3	.127	.053	.065	.034	.096
BEN10	.246	.068	-.022	-.162	.119
SUS2	-.155	-.104	.033	.179	.011
	16	17			
BAR10	.041	-.136			
BAR8	.030	-.030			
BAR6	-.085	.164			
BAR5	-.119	-.107			
BAR7	.029	-.093			
CTA5	.150	.130			
SUS9	-.025	.028			
HM7	.103	.005			
HM5	.032	.098			
SEV7	-.046	-.010			
BAR1	.070	-.053			
CTA2	-.093	.154			
BAR11	.049	-.198			
SUS8	-.131	.034			
SUS5	.069	.169			
SEV2	.021	.020			
SUS6	.004	-.022			
BEN8	.138	-.026			
BEN6	.041	.141			
BEN9	.204	.136			
BEN2	-.101	-.062			
BEN4	-.039	.260			
BAR3	.039	-.050			
BAR9	-.009	.045			
BAR2	-.071	.027			
SEV5	-.053	.093			
SEV1	.020	.038			
SEV4	-.057	.017			

Table 23 - Continued.

Item	Factors and Sorted Loadings	
	16	17
CTA6	.031	.212
CTA4	-.035	-.131
CTA7	.112	-.129
SEV9	-.296	-.175
BEN1	-.040	.008
BEN5	.034	.036
SEV3	.084	.006
SEV8	.032	.026
SEV6	-.094	.089
HM8	.026	.056
HM6	.430	.090
HM4	.351	-.149
HM9	.076	-.022
CTA1	-.217	-.002
CTA8	.000	.015
BEN7	.187	.013
SUS4	.060	-.034
SUS3	-.103	.062
HM1	.011	-.081
HM2	.137	.231
HM3	.808	.056
BEN10	-.043	.714
SUS2	.208	.592
Eigenvalue	1.05	1.00
% of Total Variance	2.1	2.0
Cum. % of Variance	66.6	68.5

TABLE 24

RESULTS OF VARIMAX ROTATION ON 49 ITEMS - SAMPLE 1

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR10	.731	-.019	.029	.178	.087
BAR8	.703	.134	.240	.086	.110
BAR7	.641	.064	-.056	.005	.012
BAR6	.638	.078	.055	.005	.012
BAR5	.584	.257	.246	.016	.014
CTA5	.446	.001	.089	.065	.141
SUS9	.069	.791	-.004	.272	.005
HM7	-.093	.774	-.102	.037	.005
HM5	.160	.764	.075	-.001	-.074
SEV7	.217	.735	-.019	.256	.035
BAR1	.095	-.083	.796	.002	.154
CTA2	.136	.003	.777	.050	.021
BAR11	.148	.030	.596	.071	.010
SUS8	.114	-.001	.099	.749	.190
SUS5	.098	.176	-.065	.687	-.189
SEV2	.121	.382	.014	.672	.072
SUS6	.212	.090	.094	.670	-.155
BEN8	-.109	.110	-.098	.120	.760
BEN9	.189	-.133	.059	.031	.674
BEN6	.027	.036	.202	-.199	.597
BEN2	.126	-.025	.328	-.092	.564
BEN4	.138	-.122	.258	-.219	.447
Eigenvalue	7.21	4.54	3.25	1.96	1.93
% of Total Variance	14.7	9.3	6.6	4.0	3.9
Cum. % of Variance	14.7	24.0	30.6	34.6	38.6

Table 24 - Continued.

Item	Factors and Sorted Loadings				
	1	2	3	4	5
BAR3	.085	-.020	.228	.060	.155
BAR9	.167	.183	.015	.059	.058
BAR2	.213	-.068	.069	.173	-.029
SEV5	.219	.348	.149	-.029	-.099
CTA6	.048	-.080	.312	.076	-.026
CTA4	.144	.213	.041	.069	.129
SEV9	.205	-.096	.119	.064	.096
CTA7	.006	.088	.426	.057	.127
SEV1	.123	.228	-.012	.153	-.069
SEV4	.077	.176	.057	.211	-.053
BEN1	-.080	.169	-.027	.079	.110
BEN5	-.177	-.082	.080	-.104	.135
HM3	.042	.130	-.000	-.012	.177
HM6	-.035	-.129	-.003	-.062	.109
HM4	-.230	-.071	.190	-.007	-.059
SEV6	-.004	-.049	.061	-.071	.059
SEV8	-.064	-.049	.055	.030	.043
HM9	.156	.004	.101	.059	.017
SUS3	.294	.136	.183	-.149	-.084
CTA1	.273	.207	.290	.166	.088
CTA8	-.051	.114	-.016	-.046	.166
BEN7	-.098	-.057	.002	.006	.183
SUS4	.101	.023	-.006	.088	.019
HM1	-.039	-.040	-.087	-.028	.148
HM2	.076	-.061	.076	.087	-.098
BEN10	-.052	.052	-.189	.084	.187
SUS2	-.106	.159	.262	.172	.048

Table 24 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
BAR10	.075	.069	-.022	-.251	-.021
BAR8	.162	.021	.103	-.073	-.035
BAR7	.236	.033	.065	.056	.108
BAR6	.144	.123	.173	-.090	-.105
BAR5	.190	.096	-.129	-.164	-.165
CTA5	-.150	.069	.166	.228	.108
SUS9	.069	.037	.194	-.026	-.117
HM7	-.003	.049	-.049	-.005	.134
HM5	.065	-.024	.126	.077	.023
SEV7	.055	.017	.263	.036	-.107
BAR1	.159	.046	.000	-.009	.071
CTA2	.088	.173	.049	.140	-.034
BAR11	.101	.284	.077	-.018	.035
SUS8	.075	.049	.082	.047	-.144
SUS5	.008	.069	.056	-.035	.090
SEV2	.034	.029	.097	.019	-.015
SUS6	.186	.067	.267	-.066	-.018
BEN8	.044	.045	.015	.189	.137
BEN9	.089	-.010	-.141	.029	.160
BEN6	-.015	.071	.063	.144	.088
BEN2	.070	.149	-.077	-.039	-.038
BEN4	-.102	.196	-.101	.156	.031
BAR3	.746	-.087	.004	-.056	.034
BAR9	.726	.215	.183	-.117	-.062
BAR2	.688	.241	.005	.103	-.027
SEV5	.582	-.070	.297	-.029	-.076
Eigenvalue	1.69				
% of Total Variance	3.5				
Cum. % of Variance	42.0				

Table 24 - Continued.

Item	Factors and Sorted Loadings				
	6	7	8	9	10
CTA6	.155	.722	.096	-.051	.082
CTA4	.091	.683	.089	.126	.007
SEV9	.016	.524	-.140	.033	-.056
CTA7	.121	.493	-.085	-.197	.078
SEV1	.106	.033	.839	.020	.046
SEV4	.124	.014	.832	-.071	-.076
BEN1	.017	-.056	-.002	.789	-.027
BEN5	-.094	.068	-.070	.697	.122
HM3	-.052	-.081	-.025	-.073	.764
HM6	-.051	.181	-.022	.100	.687
HM4	.098	-.051	.035	.374	.544
SEV6	.116	.041	.026	-.012	.037
SEV8	-.077	.003	.014	-.004	.019
HM9	.042	.212	.017	-.060	.066
SUS3	.183	.084	-.050	-.005	.010
CTA1	.155	.244	-.099	-.063	-.140
CTA8	.002	.060	.024	-.069	.048
BEN7	-.011	.141	-.039	.311	.185
SUS4	.006	.119	.017	-.009	.029
HM1	.026	.030	.064	.073	.057
HM2	-.033	-.076	-.146	.044	.152
BEN10	.036	-.006	-.059	.158	.071
SUS2	.031	-.076	.228	-.194	.106
Eigenvalue	1.69	1.68	1.50	1.42	1.33
% of Total Variance	3.5	3.5	3.1	2.9	2.7
Cum. % of Variance	42.0	45.5	48.5	51.4	54.1

Table 24 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
BAR10	.039	-.035	-.057	-.031	-.067
BAR8	-.066	.023	-.093	.090	-.147
BAR7	-.023	.035	-.059	-.016	.061
BAR6	-.134	.145	.100	-.045	.086
BAR5	.090	.151	-.043	.206	.079
CTA5	.025	.254	.024	.171	.138
SUS9	-.092	.031	.014	.085	.024
HM7	.044	-.129	.036	-.126	-.048
HM5	-.042	.095	.049	.091	-.089
SEV7	-.049	.103	.003	.073	.024
BAR1	.087	.111	-.016	.124	-.042
CTA2	.033	.082	.092	-.037	-.022
BAR11	.030	-.059	-.109	-.364	.083
SUS8	-.134	.162	.031	.069	-.068
SUS5	.063	-.073	.076	.191	.045
SEV2	-.028	.077	-.117	-.110	-.000
SUS6	.069	-.089	-.070	-.044	.101
BEN8	.181	.111	.020	-.076	.131
BEN9	-.069	.174	.089	.026	-.128
BEN6	.191	-.271	.126	.265	.123
BEN2	-.134	-.214	.222	-.093	.005
BEN4	.124	-.362	.102	.169	.068
BAR3	-.020	.111	.117	.085	-.000
BAR9	.114	.025	-.107	-.049	-.017
BAR2	-.015	-.059	-.100	.019	-.020
SEV5	-.032	.108	.233	-.088	.055
CTA6	-.112	.094	.004	.071	-.074
CTA4	.035	.136	.100	.223	.099
SEV9	.152	.146	.246	-.277	-.117
CTA7	.154	.034	-.085	.242	-.016
SEV1	.032	.021	.022	-.049	-.091
SEV4	.014	-.009	-.024	.066	.023
BEN1	-.029	-.062	-.190	.020	.076
BEN5	.006	-.014	.205	-.050	.031

Table 24 - Continued.

Item	Factors and Sorted Loadings				
	11	12	13	14	15
HM3	-.119	.025	-.013	.100	.135
HM6	.174	.052	.046	-.051	.062
HM4	.086	-.045	.341	.016	-.004
SEV6	.810	.044	.033	.068	-.129
SEV8	.780	-.036	.056	-.068	.204
HM9	-.015	.736	-.014	.022	.058
SUS3	.214	.436	.094	.324	-.059
CTA1	-.058	.328	.281	.211	-.004
CTA8	.086	.073	.823	-.004	.001
BEN7	.013	-.258	.520	.296	.081
SUS4	-.013	.061	.043	.711	.028
HM1	.029	.181	.005	.078	.799
HM2	.050	-.180	.026	-.045	.695
BEN10	.128	.046	-.007	-.169	.131
SUS2	.018	-.111	-.007	.245	.022
Eigenvalue	1.22	1.19	1.13	1.08	1.05
% of Total Variance	2.5	2.4	2.3	2.2	2.1
Cum. % of Variance	56.6	59.1	61.4	63.6	65.7

Table 24 - Continued.

Item	Factors and Sorted Loadings
	16
BAR10	-.149
BAR8	-.044
BAR7	-.064
BAR6	.167
BAR5	-.111
CTA5	.108
SUS9	.006
HM7	.018
HM5	.097
SEV7	-.020
BAR1	-.069
CTA2	.150
BAR11	-.216
SUS8	.040
SUS5	.162
SEV2	.016
SUS6	-.037
BEN8	-.010
BEN9	.133
BEN6	.162
BEN2	-.028
BEN4	.284
BAR3	-.049
BAR9	.027
BAR2	.040
SEV5	.080
CTA6	.209
CTA4	-.120
SEV9	-.099
CTA7	-.153
SEV1	.031
SEV4	.003
BEN1	.019
BEN5	.046

Table 24 - Continued.

Item	Factors and Sorted Loadings
	16
HM3	.023
HM6	.151
HM4	-.124
SEV6	.106
SEV8	-.002
HM9	-.027
SUS3	.086
CTA1	.029
CTA8	.016
BEN7	-.008
SUS4	-.050
HM1	-.052
HM2	.228
BEN10	.748
SUS2	.544
Eigenvalue	1.01
% of Total Variance	2.1
Cum. % of Variance	67.8

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