DEVELOPMENT OF THE HEALTH MOTIVATION ASSESSMENT INVENTORY

A DISSERTATION

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BY

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Date

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I am submitting herewith a dissertation written by

Melanie McEwen

entitled Development of the Health Motivation Assessment Inventory

I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

Linda Harrington
Major Professor

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DEDICATION

TO SCOTT,

For all of the Love, Help, Inspiration, Encouragement,
and . . . . . most importantly . . . . . .
the MOTIVATION.

ACKNOWLEDGMENTS

My special, heartfelt thanks to all of the people who helped me in this project:

Besides my husband Scott, thanks to all of the other McEwens (Nettijean, Russ, Laura, Diane and Ron); and to Linda Harrington, my Major Professor. Thank You All!

Development of the Health Motivation Assessment Inventory

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August, 1990

ABSTRACT

Development of the Health Motivation Assessment Inventory

What are the determinants (variables) that produce and influence the motivation of health promotional behaviors in working adults, and how do these variables interact? The desire to examine why individuals practice (or fail to practice) behaviors or actions believed to be positive for health precipitated this study. Identification and examination of the variables that individually, or collectively, work to influence behaviors, with regard to health promotion, is essential to nursing if the cooperation and participation of the client is to be elicited in his/her own care.

Health Motivation is defined as: constantly changing, multifaceted, interacting forces (either perceived or actual) that affect choices and result in behavior or actions that influence an individual's health. Utilizing the Health Motivation Model (a modification of the Health Belief Model), and Classic Measurement Theory, the Health Motivation Assessment Inventory (HMAI) was developed to measure the concept of Health Motivation.

To test the instrument and begin estimation of validity and reliability, the HMAI was administered to a convenience sample of 285 working adults at two large companies. Alpha coefficients were used to examine internal consistency reliability. Results showed that the instrument, as a whole, possessed internal consistency with Alphas greater than the desired 0.7. In addition two of the six subscales had sufficient alpha values. The other four subscale alphas showed promise, as two were in excess of 0.6 and the other two greater than .55.

To begin estimation of construct validity, factor analysis was employed to analyze relationships between the items of the instrument and test the Health Motivation Model. The factor analysis was favorable with at least three items per subscale possessing a factor loading greater than .40. Therefore, it was concluded that with some modifications, the instrument will be useful in conducting research on the motivation of health promotional practices.

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CHAPTER 1

INTRODUCTION

Why do some individuals continue to smoke following diagnosis of lung cancer or heart disease? Why does a middle-aged executive begin an exercise program? Why would a young housewife choose to lose weight? Why do people brush their teeth, go to the doctor, change their diet, or read about new medical studies and findings?

The study of motivation implies the study of the "whys" of behavior (Haber, 1966). Haber states that although there have been many formal attempts to explain the concept of motivation, there has been little success or consensus. Long studied in the psychological and philosophical disciplines, the concept of motivation has only recently received attention in the health-related fields. An indepth understanding of motivation is beneficial for nursing, particularly in the area of health promotion and motivation of healthful behaviors, and it is to this end that this study was directed.

Problem of Study

The desire to examine <u>why</u> individuals practice (or fail to practice) behaviors or actions believed to be

positive for health precipitated the present study. Identification and examination of the variables that individually, or collectively, work to influence individual's behaviors with regard to health promotion is necessary to understand health motivation.

The research problem for the present study was as follows:

What are the determinants (variables) that produce and influence the motivation of health promotional behaviors in working adults, and how do these variables interact?

Purpose of the Study

The purpose of this study was twofold. The first objective was to examine the psychometric properties of the researcher developed instrument, The Health Motivation Assessment Inventory. The study's second objective was to validate the variables identified as components of health motivation and to analyze their relationships thereby testing the underlying conceptual framework.

Rationale for the Study

The concept of motivation - "something that impels or incites a person to a certain course of action or behavior" (Webster's, 1967) has been examined and discussed in the psychological and philosophical literature for centuries (Beck, 1978 and Haber, 1966). However, motivation, as it

relates to health and health behaviors, has only recently been explored (Chinn, 1987; Cox, 1987; Horowitz, 1985; and Olivas, 1986). Even the Health Belief Model, which was developed in the early 1950s, and is probably the most accepted and frequently tested model on health beliefs and behaviors, added the concept of motivation in 1976 following the performance of numerous research studies (Mikhail, 1981). Prior to 1976, the assumption was that a patient would comply with medical advice whenever prescribed or suggested by a physician or other health care provider, or when presented with knowledge regarding positive health practices. Although failure to follow advice and compliance were examined in previous research, motivation was not an integral focus.

Nursing's knowledge and understanding of motivation of health-related behaviors is essential if the cooperation and participation of clients is to be elicited in their own care. An attempt to discern motivations, particularly related to health behavior, will assist the nurse in gaining an understanding of the client and providing more productive intervention. Finally, in addition to understanding what successfully motivates individuals to positive health practices, it appears important to identify what <u>fails</u> to motivate these practices thereby reducing

time and effort spent on interventions that are not effective in producing the desired behavior. Identification of these variables and their relative importance in determining health promotional behaviors will allow the health practitioner to target specific areas that would enhance the motivation of positive health practices.

Conceptual Framework

The present study was guided by the Health Motivation Model and classical measurement theory. The development of the Health Motivation Model will be discussed in length, followed by a presentation of relevant components of measurement theory.

Development of the Health Motivation Model

The broad concept of Health Motivation was developed for the purpose of theory construction. To this end, several steps were completed including: concept development, identification of common variables, preparation of definitions, and identification of observable indicators for the measurement of variable dimensions.

The preliminary step toward the development of a theory of health motivation involved searching the literature for relevant material regarding the motivation of healthful behaviors. The literature studied was chiefly

from health-related fields (nursing, medicine, health education) and psychology. From this work, a definition for health motivation was developed and related concepts were identified and conceptually defined. This process was guided by the strategies for concept development outlined by Walker and Avant (1983).

Following the concept analysis to develop the central concept of health motivation (McEwen, 1988), observable indicators and dimensions were outlined for the variables identified as ccomprising the concept of health motivation. This was accomplished following the guidelines stated by Waltz, Strickland and Lenz (1984). According to the authors, the identification of observable indicators and variable dimensions precedes the process of operationalizing the variables to permit subsequent measurement.

After the process of concept development and operationalization of the variables, several attempts were made to construct a model depicting the relationships among the variables utilizing criteria proposed by Gibbs (1972), Blalock (1969), Stember (1986), and Stinchcombe (1968). From these efforts at theory construction for health motivation, the model developed from Blalock's (1969) block-recursive system method for illustrating a

phenomena appeared to convey the conceptualization of health motivation the most accurately. There are several reasons for this. First, the block-recursive design is visually similar to the depiction of the Health Belief Model from which the model for Health Motivation was largely drawn (this will be discussed in detail in the next section). Secondly, Blalock's block-recursive system depicts both one-way and reciprocal causal relationships and complex feedback systems appropriate to the concept of health motivation as defined and operationalized. Finally, this model appears to explain the interworkings of the relationships more accurately than the other models which were constructed.

Following this indepth study of the concept of health motivation, and attempts at theory construction, the resulting conceptual model is essentially a modification of the Health Belief Model (HBM) as presented by Becker (1974). Other writers, particularly Cox (1985) and Pender (1987), have influenced the derivation of parts of the concept. Cox's influence lies mainly in the area of self-determinism (internal aids/hindrances) and Pender's work affected the overall construct of health motivation. Their works will be discussed in more detail in chapter two.

The Health Belief Model

The Health Belief Model (HBM) was developed in an attempt to explain health behavior and assist the health professional in better understanding of health motivation and health beliefs. Mikhail (1981), contends the HBM may be useful in identifying patients with potential risk of non-compliance or who might need extra help in following health care recommendations. It might also help in revealing inappropriate health beliefs or misconceptions about health matters that can be clarified by the nurse or other health professionals (Davidhizer, 1983).

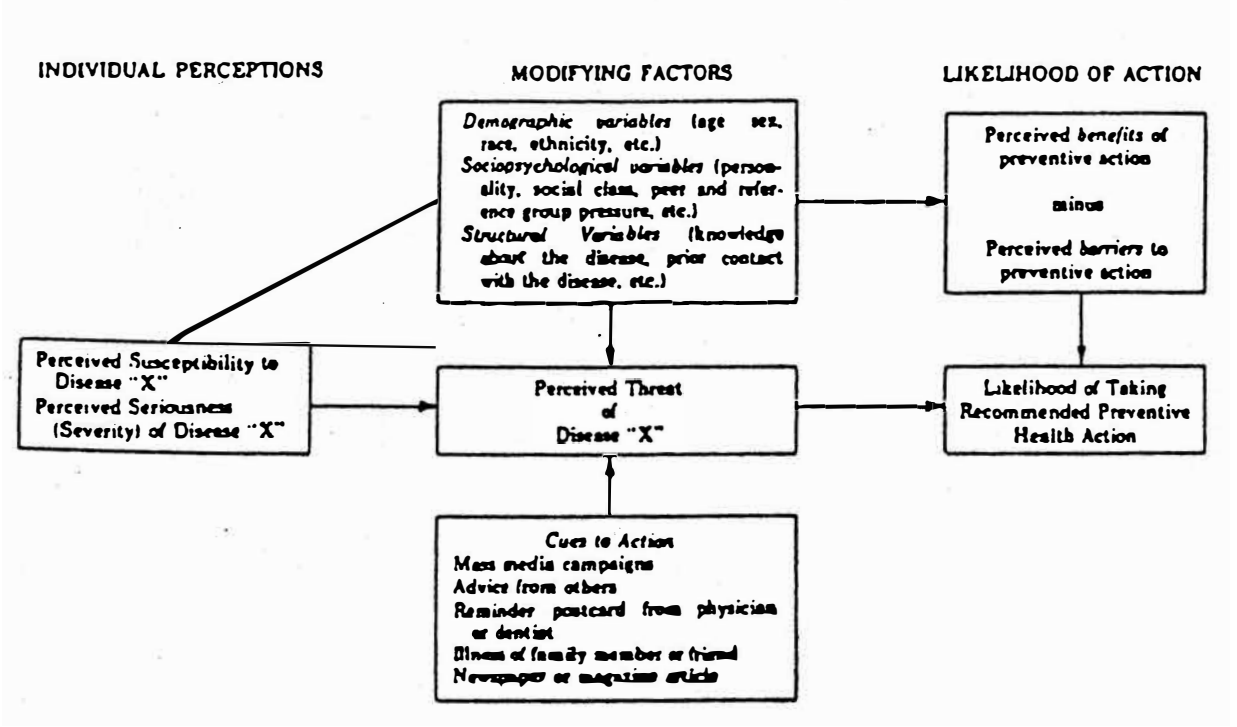
According to Rosenstock (1974), the HBM "grew out of a set of independent, applied research problems with which a group of investigators in the Public Health Service were confronted between 1950 and 1960" (p. 1). The initial researchers were all social psychologists influenced by the theories of Kurt Lewin and had a desire to build theory. Rosenstock stated that the desire was to "develop theory that would include a heavy component of motivation and the perceptual world of the behaving individual . . . and could be expected to focus on the current (ahistorical) (sic) dynamics confronting the behaving individual" (p. 2).

Maiman and Becker (1974) believe that the HBM "analyzes an individual's motivation to act as a function

of the expectancy of goal attainment in the area of health behavior" (p.21). In addition, they further propose that the HBM "should be expanded to include a separate motivational variable representing the need or desire for achieving health-related goals by employing the concept of "general health motivation"" (p. 22). Here, motivation is viewed as a disposition within the individual to desire to attain or maintain a positive state of health and avoid a state of illness.

The Health Belief Model as presented by Becker (1974) is depicted in Figure 1. The three main areas of impact in the model are (1) individual perceptions - perceived susceptibility and perceived seriousness, (2) modifying factors, and (3) likelihood of action.

The perception of susceptibility and seriousness are individualized and based on knowledge, emotional factors and concern about the kind of difficulties a disease can cause. The modifying factors include demographic variables (age, sex, race), sociopsychological variables (advice from family, personality) and structural variables (knowledge, prior contact) and will serve to effect the perceived threat of the disease. The Modifying Factors simultaneously effect the individual perceptions and "Likelihood of Action" which is composed of the perceived



The Health Belief Model

Figure 1

From: "Historical Origins of the Health Belief Model" by I.M. Rosenstock. In The Health Belief Model and Personal Health Behavior (p. 7) by M.H. Becker, 1974, Thorofare, NJ: Charles B. Slack, Inc.

benefits of the action minus the perceived barriers to action. The Modifying Factors also include "Cues to Action" (media campaigns, newspaper articles, advice) which are an integral part of the model and serve to activate or "trigger" behaviors.

Definition of Terms of the Health Belief Model.

INDIVIDUAL PERCEPTIONS:

Perceived Susceptibility - "refers to the subjective risks of contracting a condition" (Rosenstock, 1974, p. 3). Perceived susceptibility is the individual's belief in the probability that they will encounter a specific health problem. Any individual will fall on a continuum from high to low in estimation of personal degree of risk for developing an illness (Pender, 1987).

Perceived Seriousness - "the degree of emotional arousal created by the thought of a disease as well as by the kinds of difficulties the individual believes a given health condition will create for him" (Rosenstock, 1974, p. 3).

Perceived Threat - according to Becker (1974) is determined by the perceived susceptibility and perceived seriousness which combine to produce the total perceived threat of an illness.

MODIFYING FACTORS:

Demographic Factors - identified by the HBM as potentially affecting health behavior include sex, age, income, education, race, and ethnicity (Rosenstock, 1974).

Sociopsychological Variables - such as social or peer pressure, personality, and social class are listed as modifying factors (Rosenstock, 1974).

Structural variables - identified as modifying factors include previous knowledge about the disease or prior contact with the disease (Rosenstock, 1974).

Cues to Action - is the final modifying factor in the HBM. The cue to action is a stimulus (either external or internal) which must occur to trigger the health-related behavior by making the individual aware of his perceptions about the health threat (Rosenstock, 1974).

LIKELIHOOD OF ACTION: is determined to be the difference between the perceived benefits of preventive action and the perceived barriers to preventive action.

Perceived Benefits - are those beliefs about the effectiveness of the recommended preventive action (Rosenstock, 1974).

Perceived Barriers - to obtaining preventive care can be perceived or real. Perceived barriers may include such factors as: inconvenience, expense, unpleasantness, or extent of life change required. Rosenstock (1974) believes

that "these negative aspects of health action serve as barriers to action and arouse conflicting motives of avoidance" (p. 4).

Concept Linkages of the HBM.

The assumed relationships among the concepts of the HBM were summarized by Maiman and Becker (1974) as "susceptibility x severity x (benefits - barriers) ('cues to action' held necessary to activate readiness))" (p. 14). The reduction of susceptibility and severity is identified as the desired outcome of goal oriented health behavior.

Health Motivation Model

Model Differences. As stated earlier, the Health Motivation Model (HMM) is, in essence, a modification of the Health Belief Model. One of the primary differences is that the HMM focuses on the motivation of health promotional behaviors whereas the focus of the HBM is preventive actions. Other important areas of change are the separation of a variable of "Previous Knowledge," and the identification of two variables, "Internal Aids/Hindrances" and "External Aids/Hindrances." Other, more minor changes, largely semantic, were also made and will be discussed.

The variable of Previous Knowledge (PK) was included in the HBM as a "structural variable" (a component of the

Modifying Factors) and was described as "knowledge about the disease, prior contact with the disease, etc." (Rosenstock, 1974, p. 7). For the purposes of the motivation of healthful behavior, an individual's understanding of actual and potential threats to health, along with the knowledge of positive steps to reduce or remove those threats, and promote overall health, is essential. One of the most effective interventions of nurses and other health care workers is in the area of increasing knowledge and understanding of health and potential health threats. Although PK is a component of the HBM, its importance is not evident. In the HMM, however, Previous Knowledge is considered to be a very important variable in the motivation of healthful behavior.

The HMM variables of External Aids/Hindrances (EAH) and Internal Aids/Hindrances (IAH) are similar to the "perceived barriers to preventative action" component of the HBM. Rosenstock (1974) identifies barriers as being the "negative aspects of health action" which are aroused when the action is seen as "inconvenient, expensive, unpleasant, painful or upsetting" (p. 4). This depiction of "perceived barriers" has similarities to both variables EAH and IAH as presented in the HMM. However, the HMM emphasizes the importance of both internal and external

forces, which can be positive or negative, in the influence of health motivation.

External aids/hindrances are forces outside the individual that influence behaviors relative to the motivation of health promotion. Examples of external aids are a spouse who continually encourages adherence to a low-fat diet; the possession of health insurance; the availability of a convenient place to exercise; peer pressure to refuse drugs and the offering of a smoking cessation program for employees by a company. Examples of external hindrances might include: a spouse who brings home ice cream; lack of ability to pay for health care; peer pressure to take drugs; no convenient place to exercise; and close friends and co-workers who smoke.

It is apparent External Aids/Hindrances play an important role in both enabling and discouraging an individual in the motivation of health promotional behavior. Therefore, the concept of external aids/hindrances was identified as a variable in the HMM.

Similarly, internal aids/hindrances are factors within the individual which serve to promote or inhibit health promotional behavior. Example of internal aids include: success with a diet or exercise program; feelings of control (both of self and circumstances); and a desire for

a particular outcome. Internal hindrances include: perceived lack of self-control; perceived inability to control life-circumstances; failure of a diet or exercise program; and lack of desire to change or modify behaviors. Anticipation of potential rewards serves as an internal aid; likewise anticipation of pain, discomfort and cost are internal hindrances.

Internal motivations, including aids and hindrances mentioned here, may be the most important aspect in the determination of the motivation of health promotional behavior. It is surprising that a variable of Internal Motivations is not specifically addressed in the HBM (with the exception of "perceived barriers" as discussed earlier). Therefore, the variable of internal aids/hindrances was added as an integral component of the HMM.

The variable of "perceived benefits" as described in the HBM is virtually identical to the variable of "perceived value of action" as contained in the HMM. The beliefs regarding the "relative effectiveness of known available alternatives in reducing the disease threat to which the individual feels subjected" (Rosenstock, 1974, p. 4) are the perceived benefits of preventive action in the HBM. The individual's behavior with regard to health

motivation, is dependent on how beneficial (valuable) the alternative actions are perceived to be. Thus, if the individual believes that wearing a seatbelt is valuable in the reduction of threat of injury, he is more likely to use his seatbelt. The alternative action (not wearing the seatbelt) would be perceived as less valuable. Another example would be following a low-fat diet to reduce cholesterol. For the diet to be successfully adhered to by the individual, following the diet must be perceived as valuable in achieving the desired effect.

A final modification involves the changing of the HBM concept of "cues to action" to correspond with the variable of a "catalyst" in the HMM. The cue, as described by Rosenstock (1974), serves to "trigger a response" (p. 6) to perceived susceptibility and severity. According to the HBM, the required intensity of the cue must be sufficient to promote the behavior and varies with different levels of severity and susceptibility.

On the other hand, the variable of a catalyst, as described by the HMM, is necessary to promote or produce change within the model, and can affect virtually any of the variables. For example, a catalyst, in the form of awareness of a newly published study on the effectiveness of oat bran to reduce cholesterol levels, will produce a

change in the form of an increase in "previous knowledge." A birthday (catalyst) can serve to increase feelings of susceptibility; an increase in medical benefits to include the costs of health clubs can be a catalyst to external aids; marriage or childbirth can effect background variables; and a gain of two pounds during a morning weigh-in can result in a increase of internal hindrances due to a sense of failure.

Explanation of the Health Motivation Model. The Health Motivation Model is presented in Figure 2. Previous Knowledge of health threats and health promotion is the first component depicted in the model. As described earlier, some knowledge of health and potential health threats is necessary for health motivation. This knowledge is seen as influencing the variables of perceived severity, perceived susceptibility and perceived value of action. These three variables are reciprocally interactive with perceptions of susceptibility influencing feelings of severity, as well as, perceived value of health promotional actions.

The result of the cumulative perceptions drawn from these interactions is then filtered through the modifying factors consisting of: background variables, external aids/hindrances and internal aids/hindrances.

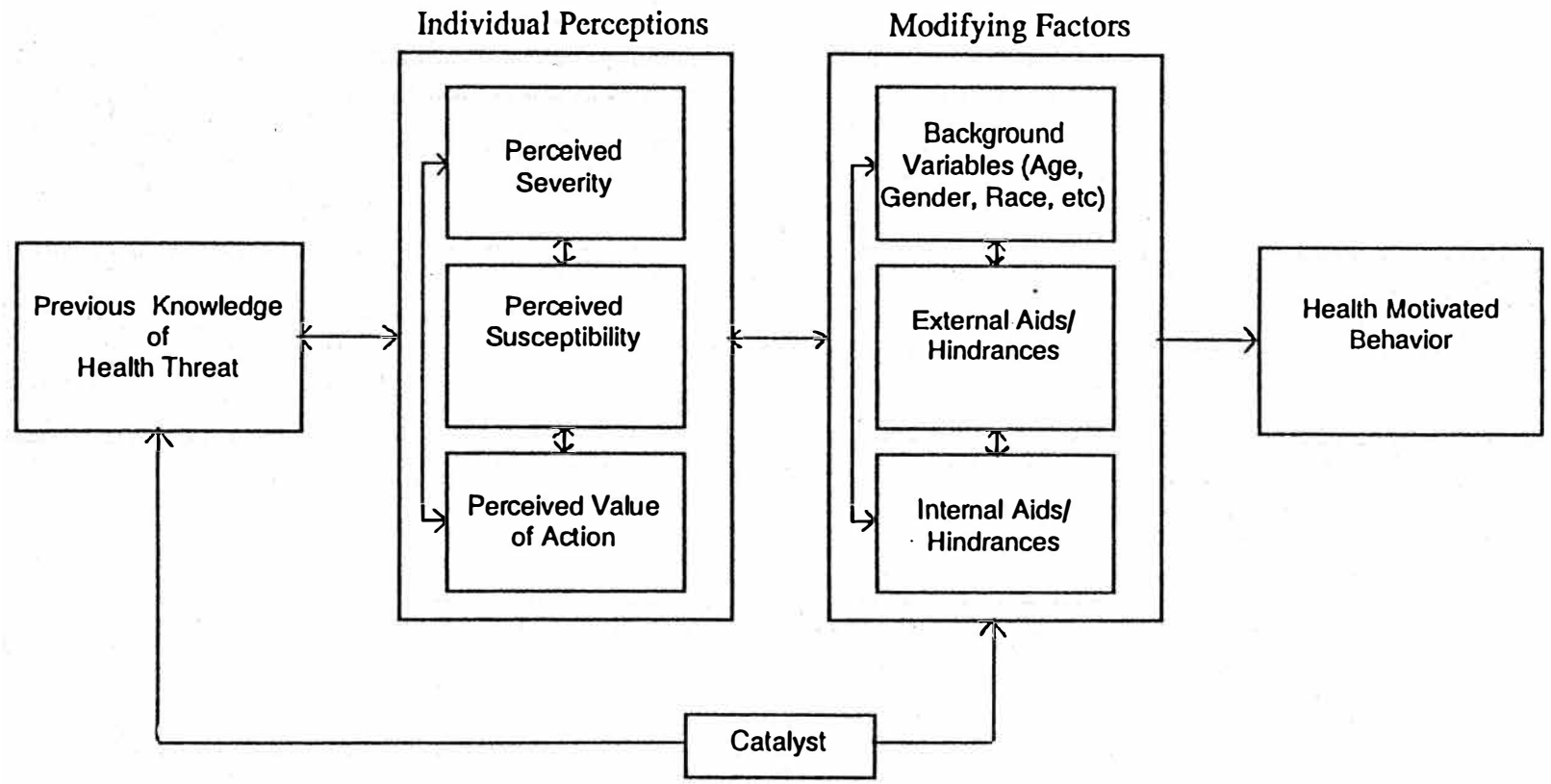


Figure 2: Health Motivation Model

These factors will individually and conjointly affect the perceptions and will then result in the motivation of health promotional behaviors. Finally, the catalyst variable is depicted as potentially influencing the relationships at either the area of PK or any one of the variables of BV, EAH or IAH to produce change in one or more of the variables and the resultant change in health motivation.

Instrument Development and Measurement Theory

According to Kerlinger (1973), measurement of any type involves some error. This error may be termed systematic or random. Random error is error that causes an individual's observed score to vary haphazardly around their true score, whereas systematic error is consistent and is considered part of the true score (Burns and Grove, 1987). It is random error which influences measurement results and which is desired to be estimated and minimized.

Within measurement theory, each person has a true score which would be obtained if there were no measurement error present. However, due to the presence of random error, any obtained score is composed of both the true score and error. If the obtained score varies a great deal from the true score, there is more random error present (Nunnally, 1978).

Reliability Issues. Reliability represents the degree of random error. If an instrument has high reliability, the corresponding random error is small; consequently, if reliability is low, random error is considered to be high.

Reliability is concerned with how consistently the measurement measures the concept of interest. Reliability of an instrument refers to its consistency (stability), equivalence and homogeneity (Brink and Wood, 1988). "Stability is concerned with the consistency of repeated measures" (Burns and Grove, 1987, p. 291) with a stable instrument being one that produces the same results using the same subjects in repeated efforts. Test/retest measurement is considered the "classic" test of stability (Brink and Wood, 1988) with "repeated measurements over time using the same instrument on the same subjects is expected to produce the same results" (p. 173).

Tests of equivalence (repeatability) are utilized in determining if similar tests given at the same time produce the same results. Inter-rater reliability is judged when two observers are compared to conclude if they are assessing the measurement criteria in the same manner (Brink and Wood, 1988). In comparing two paper-and-pencil instruments to determine measurement of the same trait, alternate forms or parallel forms are utilized.

Internal consistency (homogeneity) "refers to the extent to which all parts of the measurement technique are measuring the same concept" (Brink and Wood, 1988, p. 176). Brink and Wood go on to state that a questionnaire designed to measure a single concept should be tested to ensure that all items are contributing consistently to the overall measure of that concept. They conclude by stating that "internal consistency must be established before an instrument can be used for research purposes" (p. 177).

To assess the internal consistency of an instrument, the alpha coefficient is "the preferred index of internal consistency reliability" and "measures the extent to which performance on any one item on an instrument is a good indicator of performance on any other item in the same instrument" (Waltz, Strickland and Lenz, 1984, p. 136). Tests of internal consistency are based on the idea of split-half correlations in which scores on one half of a subject's responses are compared to scores on the other half. The Cronbach's alpha coefficient "correlates each individual item with each other item and the overall score, thus giving an overall measure of the consistency with which the score on an item can be used to predict the overall attribute being measured" (Brink and Wood, 1988, p. 176).

Burns and Grove (1987) state that a coefficient value of 1.0 would suggest that "each item in the instrument would be measuring exactly the same thing" (p. 293), but a "slightly lower coefficient (0.8 to 0.9) indicates an instrument that will select more richly the fine discriminations in levels of the construct" (p. 293). Nunnally (1978) confirms that a reliability of .80 is considered the lowest acceptable coefficient for a well-developed measurement tool, although for developing instruments 0.70 is permissible.

Finally, Shelley (1984) states that unlike most correlation coefficients based on the Pearson product moment correlation, the reliability coefficient is never squared for interpretation. Thus, "if a reliability coefficient is .86, the shared variance is 86 percent" (p. 329).

Validity Issues. According to Burns and Grove (1987), the validity of an instrument is the "determination of the extent to which the instrument actually reflects the abstract concept being examined" (p. 293). Nunnally (1978) states that determining the validity of an instrument is "to inquire whether the instrument is useful scientifically" (p. 86). There are several types of validity described in the literature, including content

validity, predictive (criterion) validity and construct validity (Kerlinger, 1973; Nunnally, 1978; Burns and Grove 1987).

Content validity verifies that the instrument actually measures the concept it was designed to measure. By comparing the test of interest to relevant literature or by employing a panel of "experts" in the field to evaluate the content of the instrument, content validity is estimated (Brink and Wood, 1988; Burns and Grove, 1987).

Predictive or criteron-related validity determines the effectiveness of the instrument in predicting a future event by using correlational analysis (Burns and Grove, 1987). According to Brink and Wood (1988), concurrent validity is also a type of predictive validity and can be estimated if the results of the tested instrument are compared, and have a high correlation with an established instrument which measures the same concept or a related concept.

Construct validity involves "testing the theory that underlies the research." (Brink and Wood, 1988, p. 171). Burns and Grove (1987) state that construct validity is the most important type of validity to examine and occurs over a period of many years. Burns and Grove list the steps involved in the establishment of construct validity. This

list includes: concept analysis, factorial validity (factor analysis), contrasted groups, convergent validity, divergent validity, nomological network validity, and successive verification.

Assumptions

Assumptions for the present study were:

1. Indicators of the concept of health motivation are measurable.
2. Health is a state that is desirable by all individuals.
3. An individual's health is, at least partly, controlled by the individual.
4. Attitudes, values, beliefs and behavior are interrelated.
5. Motivation is a response to stimuli.
6. Motivation is primarily internally controlled.
7. All health promotional behaviors are not necessarily motivated by health concerns.

Hypotheses

The following hypotheses were tested by the present study:

H1. The internal consistency reliability for Part I of the Health Motivation Assessment Inventory

will be greater than or equal to 0.7.

H2. The internal consistency reliability for Part II of the Health Motivation Assessment Inventory will be greater than or equal to 0.7.

H3. The internal consistency reliability for each of the subscales of Previous Knowledge, Perceived Susceptibility, Perceived Severity, Internal Aids/Hindrances, External Aids/Hindrances, and Perceived Value will be greater than or equal to 0.7.

H4. Previous knowledge, perceived value, perceived severity, perceived susceptibility, external aids/hindrances, and internal aids/hindrances, are factors related to the concept of health motivation indicated by at least three items for each subscale attaining factor loadings of .40 or greater

Definition of Terms

HEALTH MOTIVATION - is comprised of constantly changing, multifaceted, interacting forces (either perceived or actual) that affect choices and result in behavior or actions(s) that influence the individual's health.

PREVIOUS KNOWLEDGE OR/EXPERIENCE - is the amount or level of information or understanding of health and potential threats to health possessed by the individual.

INTERNAL AIDS/HINDRANCES - are internal feelings, attitudes, thoughts and beliefs that promote or inhibit action or responses.

EXTERNAL AIDS/HINDRANCES - are external events, individuals, prohibitions, obstacles, enhancers or promoters that encourage or inhibit action or response.

PERCEIVED VALUE OR OUTCOME OF ACTION - the beliefs or benefits the individual associates with a particular action, response or treatment.

PERCEIVED SUSCEPTIBILITY - or vulnerability; the individual's understanding of a health threat(s) and the estimated probability that he/she will encounter it.

PERCEIVED SEVERITY - the individual's conviction or emotional arousal elicited by knowledge of the health threat and the degree the health threat is believed to influence the individual's life.

BACKGROUND VARIABLES - demographic factors, such as: sex, race, cultural background, marital status and education level, that might influence actions, attitudes and beliefs about health related issues.

Limitations

The following limitations may affect the conclusions of this study:

1. The study was limited to the assessment of reliability by internal consistency.
2. Although the HMAI is designed to measure Health Motivation in working adults, the sample only allows for generalization of the findings to the population from which the sample was drawn.

Summary

Health motivation is an important concept to be studied for the purpose of understanding behaviors related to health promotion. The Health Motivation Model, as presented in the present chapter, is a modification of the Health Belief Model, and encompasses the concept of health motivation. The purpose of the study was the psychometric testing of an instrument developed from the identified and defined variables of the Health Motivation Model and testing of the relationships among the model's variables to support the validity of the model.

The next chapter focuses on the literature review. Here, a more detailed explanation of the derivation and placement of the study within the framework of nursing knowledge will be presented.

CHAPTER 2

REVIEW OF LITERATURE

The literature review which guided the present study covers several areas. General motivation definitions are examined briefly, followed by a more detailed look at health motivation. The Health Belief Model is then discussed. Included in the discussion are research studies utilizing the HBM as a conceptual framework and studies designed to test components of the HBM. Following this, existing instruments measuring concepts similar to health motivation are explored.

Motivation Definitions

"To provide with a motive; to stimulate the active interest of; something within a person that incites him to action; a prompting force or incitement working on a person to influence volition or action" (p. 1475) are definitions of motivation listed in Webster's Dictionary. Other definitions of motivation are multitudinous and were discovered from many sources, predominantly psychological literature.

McTeer (1972) defined motivation as "the active integrated and directed behaviors of the organism" (p.12). Beck (1978) described motivation as being "concerned with

the contemporary determinate of choice (directions) persistence and vigor of goal-directed behavior" (p. 24). Valle (1975) wrote that motivation is "dynamic and reversible determinants of behavior" (p. 23).

Probably one of the best known theories of motivation comes from Maslow (1970). Maslow identified five "needs" that serve as motivators: Biological, safety and security, belonging, self-esteem, and self-actualization. His theory depicts a hierarchy in which the lower level needs (biological, safety and security) must be met before higher level needs emerge. The belief that more than one need may be operating at once, but only one will dominate, is another important assumption in Maslow's theory of motivation.

Definitions of Health Motivation

Definitions of health motivation are more difficult to identify. Cox (1985) views health motivation as "an important antecedent variable and correlate of the client's cognitive and effective responses to a health concern" (p. 177). Horowitz (1985) developed the Self-Care Motivation Model which is concerned with "the totality of those forces that affect the individual's decision making, and motivate lifestyle choices and habits that affect health" (p. 57). Olivas (1985) defines health motivation as "a force within the individual which is developed as he/she gains experience

with the illness as a function of time" (p. 42). Finally, Becker and Maiman (1985) used motivation to refer to "differential emotional arousal in individuals caused by some given class of stimuli (e.g. health matters)" (p. 17).

From these definitions and other studies on health motivation, a theoretical definition for health motivation was developed by the researcher. Thus, health motivation is defined as being comprised of constantly changing, multifaceted, interreacting forces (either perceived or actual) that affect choices and result in behavior or action(s) that influences the individual's health (McEwen, 1988).

Examples of Health Motivation Studies

There is a growing amount of pertinent literature in the health fields regarding differing ways of viewing and attempting to understand health motivation. For example, several recent studies have been documented on efforts attempting to motivate healthful practices. In a study involving motivation of exercise for optimal health, Serfass and Gerberich (1984) reported success in employing a health educational program and assessment on participants' health needs. Their efforts showed positive correlational results when education was used as continuous motivation reinforcement for health promotional behaviors.

Desharnais, Godin and Jobin (1987) studied the motivational characteristics of two computerized health risk appraisals (HRA). They concluded that both the negative and positive feedback properties of the HRAs influenced intention to exercise. Protection from danger was discussed as a primary motivator of the intent to change behavior. They further concluded that conviction of a high level of susceptibility to a threat (i.e. family history of a disease) is an even more powerful motivator.

Morris and Temple (1985) examined motivation for smoking cessation. In this study, the use of spirometric testing to develop "lung age" estimates was employed in an attempt to demonstrate to smokers decreased lung capacity and increased aging of the lungs, thereby motivating the subjects to stop smoking. Although the number of subjects tested was small (n = 58), it was concluded that spirometric testing and explanation of the results to the smoker demonstrated effectiveness as many of the subjects reported intent to stop smoking. In Morris and Temple's study, too, perception of danger, susceptibility to disease, and ability to control behaviors to change susceptibility were seen as the motivating factors for positive health change.

Other researchers have attempted to correlate the motivation of positive health practices to other factors.

In one study regarding health motivation and dietary sodium intake, Thomas (1984) was not able to support the hypothesis that high health motivation was associated with dietary sodium intake. Likewise, Pender and Pender (1988) found that weight and perceived health status did not influence intention to control weight. Although intentions to eat a diet to control weight and avoid highly stressful situations were associated with positive attitudes toward intention (motivation) to engage in these behaviors, those persons at highest risk for health crises were the least likely to engage in positive dietary behaviors.

Cox (1987) chose a different approach to the investigation of health motivation by studying intrinsic motivation in the elderly. She determined that the more intrinsically motivated the individual, the less likely that individual was to smoke; the more intrinsically motivated were less likely to take tranquilizers; and that the perceived health care competency of the elder is decreased as symptoms become more numerous and frequent. Level of education, perceived health status, social network and gender were all found to be correlated with self-determined (intrinsic) health decisions, with those with positive perceptions of their health, with smaller networks, more educated females consistently found to be more self-

determined in their health behavior.

Thus, several recent research studies have been performed dealing with aspects of health motivation. Methods or programs to encourage or affect health motivation, (the use of HRAs or spirometric lung testing) have shown success in encouraging health promotional behaviors. However, other studies, dealing with correlation of positive health behaviors and motivation, have provided confounding information on what motivates healthful behaviors. High levels of "self determinism" (intrinsic motivation), particularly in the absence of symptoms, is correlated with health promotional behaviors, but, weight control, dietary sodium intake and "perceived health status" were not shown to be associated with positive health actions. Therefore, while studies that attempt to discern aspects of health motivation are available, it is difficult to find research specifically directed at determining what produces health motivation.

The Health Belief Model as a Conceptual Framework

There were many examples in the literature utilizing the Health Belief Model as a conceptual framework for a research study. Brooks, Kirkpartick and Howard (1981) developed an "activity-centered health curriculum" using the HBM as a guide. The researchers reported that students who

were given instruction in the activity-centered health curriculum reported significantly more intention to change health behaviors in a positive direction. Perceived susceptibility, perceived seriousness and perceived preventability were three of the HBM subscales used in determination of change behaviors.

Muhlenkamp, Brown and Sands (1985) utilized the HBM as a framework for examining the determinants of health promotional activities in nursing clinic clients. Focusing on the efficacy of actions, the researchers found the following: health value was not associated with health promotion activities or types of clinic visits; strong belief in chance was negatively associated with engaging in health promotional activities; and a strong belief in powerful others was negatively associated with a high percentage of restoration visits.

The HBM was used as a framework for the development of a tool to predict patient entrance into a cardiac rehabilitation program (Hijeck, 1984). Hijeck concluded that the tool developed from the HBM was useful in "revealing patient beliefs that are erroneous or misguided and prevent the patient from participating in rehabilitation care" and "can indicate patient beliefs that promote rehabilitative care" (p. 455).

The Health Belief Model - Studies Testing the Model

As with the large number of research studies utilizing the Health Belief Model as a conceptual framework, there were also many studies testing the model. Melnyk (1985) examined the HBM variable of perceived barriers to preventive health care. Operationalizing the concept of "barriers" as ""costs" associated with taking health action" (p. 80), the researcher determined there were five categories of barriers: the provider-consumer relationship, cost, access, fear, and inconvenience. Melnyk concluded "the concept of perceived barriers to care as originally defined contributes as much to understanding health behavior as other determinants . " and "it supports the argument that health behavior is not a unitary phenomena and that the determinants may have different effects for different health behaviors" (p. 81).

Becker, Maiman, Kerscht, Haefner and Drachman (1977) tested the variables of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Findings supported the importance of each of these variables in the determination of compliance behavior by mothers of obese children. Specifically, the mother's perception of how easily her child gets sick (perceived susceptibility) and heightened perceptions of potential seriousness that

illnesses pose to their children (perceived severity) were shown to influence the mother's compliance with the prescribed dietary regimen. The concept of barriers, with relation to compliance, was also supported although the results were not predictive of actual weight loss. Overall, it was concluded that the HBM "appears to be useful in the explanation and prediction of a mother's adherence to a diet regimen prescribed for her child" (p. 360).

While studying sociobehavioral determinants of compliance with health care recommendations, Becker and Maiman (1975) cited in excess of ten research studies which supported the variable of perceived susceptibility in determining health behaviors. Within this context, the researchers concluded "that "perceived susceptibility" has demonstrable explanatory and predictive value, and should be a fundamental part of a psychosocial compliance model" (p. 14). In contrast, Becker and Maiman list a number of research studies that suggest that "no (or even negative) association exists between medical views of the problem's severity and patient compliance" . . but "further examination of these findings suggest that, for the asymptomatic individual, very low levels of perceived severity are not sufficiently motivating, while very high levels of perceived seriousness are inhibiting, thus, both

extremes are associated with low likelihood of taking preventive health action" (p. 14).

Breast self-examination was a very frequently studied behavior with regard to the HBM. Champion (1988) found that barriers, health motivation, control, susceptibility, and seriousness significantly contribute to the intent to practice breast self-examination with barriers accounting for the greatest amount of variance. Interestingly, "susceptibility and seriousness, although significant, contributed only minor amounts to overall variance" (p. 287). One other remarkable finding from this study related to demographic variables (modifying factors in the HBM), was that "persons who had never married or were separated had a lower intent to practice breast self-examination" (p. 290).

Other studies by Champion (1985 and 1987), concluded that the concept of barriers was the most significant in determining the intent to perform breast self-examination with general health motivation and perceived benefits also being significant. And as with the previous study, the concepts of perceived susceptibility and perceived seriousness were not found to be related to breast self-exam.

Hallal (1982) found susceptibility and perceived benefits were significantly related to the practice of

breast self-examination as did Massey (1986). And, finally, Champion (1987) discussed findings by The Opinion Research Corporation as well as those of Trotta (1980) which indicated increased knowledge about breast cancer, younger age, and higher education level all accounted for increased incidence of breast self-examination.

In her critique of the HBM, Mikhail (1981) concluded the variable of perceived susceptibility was the most supported within the model. To illustrate this, she cited numerous studies dealing with a wide variety of preventive behaviors influenced by perceived susceptibility. Likewise, she determined perceived severity, perceived benefits, and perceived costs (barriers) were supported by research findings. The variable of "cues to action" however, was the least documented and "in need of intensive study" (Mikhail, 1981, p. 71) . . . and "because the studies done on one or more of the factors included under the category of modifying variables have not tested their role in modifying health beliefs . it is probably impossible to test the HMB as a whole" (p. 71).

Davidhizer (1983) agreed with this conclusion. In a critique of the HBM, Davidhizer resolved that the variables of cues to action and modifying variables are the most difficult to study and therefore the most problematic to

validate.

It is apparent that the Health Belief Model has undergone a significant amount of testing producing largely favorable results with regard to support of the model. As indicated by the studies presented, certain variables (perceived susceptibility, perceived severity, barriers) possess more empirical support than others (cues to action, modifying factors), although common sense and experience indicate that various modifying factors (age, sex, race, etc.) and cues to action play a part in determining health behaviors. Although the HBM is only partially developed as a theory, Davidhizer (1983) stated "further development, refinement and testing of the model should produce a theory useful to the practitioner in understanding the role of education in increasing the perception of clients regarding the efficacy of the health behavior and benefits of action" (p. 471-472).

Existing Instruments Related to the Concept of Health Motivation

From the literature, three instruments were discovered which examined concepts similar to the concept of health motivation as defined. The instruments examined were: The Health-Promoting Lifestyle Profile, developed by Walker, Secrist and Pender (1987); The Health Self-Determinism

Index, presented by Cox (1985); and The Scales of Susceptibility, Seriousness, Benefits, Barriers and Health Motivation (Champion, 1984).

THE HEALTH-PROMOTING LIFESTYLE PROFILE

Walker, Secrist and Pender (1987) described the purpose of the Health-Promoting Lifestyle Profile (HPLP) as evaluating the patterns and determinants of health-promoting life-styles as well as the effects of interventions to alter life-styles. Health-promoting life-style was defined as "a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual" (p. 77). The instrument consists of forty-eight items, in which responses are indicated on a Likert-type scale from 1 to 4 where 1 = never, 2 = sometimes, 3 = often and 4 = routinely. Through factor analysis, the HPLP was divided into six subscales or dimensions: self-actualization, health responsibility, exercise, interpersonal support, nutrition and stress management. The authors of the HPLP reported excellent reliability statistics. The alpha coefficient for the total instrument was listed as .922. The subscale alpha coefficients ranged from .702 to .904 (p. 80). For estimates of stability, it was stated that the HPLP was

administered to a sample of 63 adults at an interval of two weeks, with reported Pearson r correlations of .926 for the total scale and a range of .808 to .905 for the subscales.

Although the HPLP demonstrated excellent reliability it "focuses on health-promoting behaviors as a singular concept" (Pender, 1987, p. 144). Whereas the purpose of the HPLP is to define and determine what is health-promoting lifestyle, it does not attempt to examine why the individual desires or fails to desire this type of lifestyle. Thus, the instrument was deemed inappropriate for a study of what motivates a health-promoting lifestyle.

THE HEALTH SELF-DETERMINISM INDEX

"The Health Self-determinism Index (HSDI) was proposed as a measure of intrinsic motivation in health behavior" (Cox, 1987, p. 1). The instrument consists of four subscales, the individual's: self-determined health judgements, self-determined health behavior, perceived competency in health matters, and internal-external cue responsiveness. According to Cox, "the HSDI may be helpful in pointing to nursing interventions that can be specifically matched to a client's motivational orientation . . . its use in clinical nursing investigations will begin to define more precisely the antecedents and correlates of motivation in health behavior" (p. 1).

The HSDI consists of seventeen Likert-type questions, rated on a scale of 1 to 5, where 1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; and 5 = strongly agree. Cox (1987) reports very good alpha coefficients across three studies. These coefficients range from .80 to .87 for the total instrument. The reliability of the factors subscales was: self-determined health judgements - 0.75; self-determined health behavior - 0.75; competency - 0.67; and internal-external cue responsiveness - 0.70. Examples of question from the HSDI include:

1. For me, it takes more willpower than I have to do the things that I know are good for my health. (competency subscale)
3. Only a doctor really knows whether or not I am in good health. (self-determined health judgement subscale)
4. Some people think that a doctor should decide about what to do about their health care, but I feel that I should decide. (self-determined behaviors subscale)
5. I worry about my health. (internal-external cue responsiveness subscale)

The focus of the HSDI is more congruent with the present study than the HPLP. The ability to examine and

document intrinsic motivation of health practices was similar to what was desired. However, the HSDI's focus on intrinsic motivation appeared limiting when the intent was to study other factors that influence health motivation.

HEALTH BELIEF MODEL SCALES OF SUSCEPTIBILITY, SERIOUSNESS, BENEFITS, BARRIERS, MOTIVATION.

Champion (1981, 1984) developed an instrument designed to test the health belief model specifically in breast self-examination. Five separate scales were developed to measure the variables of the HBM. These scales are: susceptibility, seriousness, benefits, barriers, and motivation. Alpha coefficients for each of the scales presented were: susceptibility - 0.77; seriousness - 0.78; benefits - 0.61; barriers - 0.76; and health motivation - 0.60. In addition test-retest results were excellent for four of the five scales with only that of benefits being less than 0.50.

Examples from each of the scales are listed below.

My chances of getting breast cancer are great. (susceptibility)

The thought of breast cancer scares me. (seriousness)

I have a lot to gain by doing self breast exams. (benefits)

It is embarrassing for met to do monthly breast exams. (barriers)

I frequently do things to improve my health.

(motivation)

Although this instrument was developed to study breast self-examination, Champion (1984) stated "the scales developed from this research can be used with substitution of a word or phrase to test the HBM using many different behaviors" (p. 85). In addition, she advocated the usage of the HBM for the development of nursing interventions.

The instrument(s) presented by Champion (1981, 1984) proved to be the closest match to what was desired for a study of health motivation. This was primarily due to the conceptual framework. However, as the underlying framework of the HBM was altered, simple modification of these scales was not considered appropriate.

Summary

A thorough review of the literature provided a current picture on relevant and available information regarding the concept of health motivation. Initially, definitions of motivation were examined. This was followed by specific definitions of health motivation and concluded with the presentation of a theoretical definition of health motivation.

The next section discussed the use and testing of the Health Belief Model as describe in the literature. A number

of studies were presented both utilizing the HBM as a framework for the development of a study and testing components of the model. This section (model testing) revealed a large number of documented support for HMB constructs. Although some variables (perceived benefits, cues to action and modifying factors) had little empirical support, others (perceived barriers, susceptibility and severity) were well supported. The literature also revealed the importance of the concept of health motivation within the HBM, and the potential importance of a variable of "previous knowledge" not explicitly contained in the HBM.

Finally, brief overviews of three related instruments were discussed. Similarities and differences were outlined and rationale for creating a new instrument specific for the study of health motivation was presented. As the purpose of the present study was to test and validate an instrument to measure health motivation, Chapter Three will describe, in detail, the process used in the estimation of reliability and validity of the Health Motivation Assessment Inventory.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A methodological study design, as described by Kerlinger (1973), is appropriate for the development, testing and evaluation of research instruments. A methodological study focuses on the identification and measurement of identified variables. Scale construction, item writing and various methods for analysis and estimation of reliability and validity of measurement instruments are the areas of concentration within a methodological study design.

Setting

The sites for the administration of the Health Motivation Assessment Inventory (HMAI) for the present study were two large manufacturing companies in a major metropolitan area in the southern United States. The questionnaires at both sites were distributed and collected at the worksite where participants were requested to complete them privately.

Population and Sample

The target population is the sample chosen from the

identified study population (Burns and Grove, 1987), and it is to this group (the target population) that the findings of the study will be generalized. The target population for for this study was adults working at large manufacturing or production corporations.

Sampling technique. A convenience sample was be used for the present study. Convenience sampling allows the use of an available group for a research study. Shelley (1984) explains that in a convenience sample, subjects are entered into the study until the desired sample size is reached. No attempt is made to ensure that all possible members of the target population are considered for inclusion as part of the sample, making convenience sampling a nonprobability (where probability of inclusion in the sample is not equal or known) sampling technique.

As a non-random sampling technique, convenience sampling presents problems with potential bias. To control for potential bias, Burns and Grove (1987) state that the researcher should identify and describe any known bias in the sample and carefully describe the circumstances of sample selection. As much data as possible should be collected and reported about the study sample allowing for comparison of the sample with the target population, as well

as other populations (Burns and Grove, 1987).

Data collection was performed at both sites through indivuals involved in health promotion programs. At one site, the questionnaires were distributed by the occupational health nurse as she came in contact with employees. This contact could take many forms: employees would come to her office for information or help on another matter; she might see them at a meeting or in the hallway; or she would encounter them in the lunchroom and would ask them to complete the form and return to the health clinic.

Questionnaires at the other site were distributed in much the same way. At this site, the forms were given out by a member of the Health Promotion Committee - a committee designated to oversee aspects of employee health. Here, too, the questionnaire distribution was one of convenience, where employees were asked to participate as they were encountered.

Each participant was given the Health Motivation Assessment Inventory (HMAI) including a letter explaining the purpose of the study, instructions for completion of the questionnaire, and a statement regarding the strictly voluntary and anonymous nature of the study. Pencils and instructions for collection of the completed questionnaires were provided.

To overcome possible bias and resulting threats to generalizability, the researcher recorded the number of questionnaire distributed at each site, and the number that were returned. Additionally, all questionnaires returned, even if they were not complete, were used to calculate a response rate.

Sample Size. According to Kerlinger (1973), the general rule is to make the sample as large as possible. Overall, large samples are better approximations of the target populations than small samples as sampling error decreases as sample size increases. Burns and Grove (1987) state that factors to be considered in determining sample size "include the type of study, the number of variables, the sensitivity of the measurement tools, the data analysis techniques and the expected effect size" (p. 219). Descriptive surveys and correlational studies, like the present study, usually use large samples due to the large number of variables examined (Burns and Grove).

The minimum number of subjects for each variable category is five (with 10 or 20 items being preferable), according to Burns and Grove (1987). As the present study was designed to develop a research instrument, each item is considered a variable. The instrument is divided into two sections which are designed to be analyzed separately (this

will be discussed in detail in the next section) with Part I consisting of seventeen questions (22 for women) and Part II consisting of forty-six questions (including demographics). Using the larger of the two numbers (46), the minimum number of five participants for each item, the study sample size should be at least 230. With the desire to obtain more participants per variable, five hundred questionnaires were distributed. Of these 293 were returned and 285 were usable for a response rate of 57%.

Protection of Human Rights

As the present study was a survey of adults, eliciting information of a nonsensitive nature, and in which participant identity is protected, written permission to conduct the proposed study from The University's Human Subjects Review Committee was not necessary. The cover letter, as described previously (see appendix), served to explain the purpose of the study and states that completion and return of the form constitutes consent to be a part of the study.

Instrumentation

The primary purpose of this study, as has been stated, was to develop and refine an instrument to measure the concept of health motivation. A multi-step process was employed for instrument development. This process consisted

of an extensive literature review, concept analysis and development, and concept operationalization which included: conceptual mapping, writing variable definitions, variable dimensions and observable indicators and finally developing a means of measurement through item writing (Waltz, Strickland and Lenz, 1984).

The Health Motivation Assessment Inventory

For the purpose of instrument development, health motivation was defined as being comprised of constantly changing, multifaceted, inter-reacting forces (either perceived or actual) that affect choices and result in behavior or action(s) that influences the individual's health. Initially, six factors, or variables, were identified as determinants of health motivation (this has been modified slightly as will be discussed later) and it is these factors that were tested by the original instrument. The initial factors were:

1. Internal obstacles/aids.
2. External obstacles/aids.
3. Perceived value of action.
4. Perceived susceptibility and seriousness of a health threat.
5. Previous knowledge or experience with a potential health threat.

6. Modifying factors - age, race or ethnicity, sex, income, education, marital status.

Conceptually, these variables are seen as factors which are continually interacting upon each other, thereby influencing the outcome of health motivation. The process of health motivation is visualized as being multi-dimensional, dynamic and equilibrium seeking with the potential for change at any time if acted upon by an internal or external catalyst.

In an attempt to capture the multifaceted essence of health motivation, the instrument was designed in three parts. Part I is comprised of seventeen questions (22 for females). In this section, the respondent is asked to complete a number of multiple choice questions to determine specific motivations for health-related actions. In addition, this section is to be used to ascertain behaviors and actions the respondent employs that are believed to promote health. This, then, can be utilized to compare with results obtained from the remainder of the instrument. Directions at the beginning of Part I instruct the participant to "circle the most appropriate response to each question." In addition, they are told to rank choices if more than one response applies.

Part II of the instrument is composed of items which

are completed on a Likert-type scale. Each item for this section was written specifically to measure one of the identified variables of the concept of health motivation. The testing of the underlying theory through verification of the variables and examination of their relationships is the primary purpose of this section. All of the items in Part II of the HMAI specifically address health motivation in relation to actions, beliefs and knowledge associated with cardiovascular disease. Cardiovascular disease was chosen primarily because it is the major cause of morbidity and mortality in the United States and one in which the individual can exhibit some control by positive life-style habits. In addition, public awareness of risk factors of heart disease, and possible preventative actions, has increased significantly in the past few years making it of interest to many people.

Likert Scale Issues. In Part II of the HMAI, a Likert scale format was selected for a number of reasons. In their study on the comparison of the Likert scale and other forms of attitude measures, Tittle and Hill (1967) found the Likert scale to be the "best predictor and to exhibit the greatest reliability" (p. 211).

Adams and Schvanleveldt (1985, p. 162) list the steps in developing a Likert scale. Their suggestions include the

development of a pool of items with the same number of positive and negative scores. They state that the typical response has 5 points composed of (1) strongly agree (2) agree (3) undecided (4) disagree and (5) strongly disagree. Babbie (1973) concurs that responses are divided and scored from 1 to 5 with 5 indicating "strongly agree" for positive items and 1 indicating "strongly disagree" for negative items. The use of both positively and negatively worded statements is employed to encourage the respondent to read carefully. The final instrument according to Babbie, should be comprised of 20-30 items.

Likewise, Reckase (1984) describes the development and usefulness of a Likert scaled instrument and states that the form of a Likert questionnaire consists of a statement concerning the concept followed by scaled responses of either 3, 5 or 7 choices. Reckase suggests that the researcher should prepare at least twice as many items as desired for the final instrument, with half being negatively worded. Miller (1970) states that following analysis, the items which differentiate best (at least six per subscale) are then used to form the final scale.

For the HMAI, the respondent is asked to choose the best response to each statement. This is accomplished by circling a choice of SA for STRONGLY AGREE, A for AGREE, N

for NEUTRAL or NOT APPLICABLE, D for DISAGREE, or SD for STRONGLY DISAGREE.

Finally, Part III was designed to capture aspects of the variable defined as a catalyst. For this portion of the instrument, the individual is asked to describe an anecdote or critical incident in which he/she was motivated to engage in an action or behavior that was perceived as beneficial to health. The responses from this section are to be examined independently of Parts I and II of the questionnaire. Here answers should be categorized and analyzed to look for similarities, differences and trends to explore health motivation from another angle.

For coding purposes, each item in Part I is assessed to ascertain what specific, personal health promotional and preventative actions the individual reported. In addition, this section determines which behaviors and actions are done primarily for health reasons and which are not. The responses can then used for comparison purposes with Part II. Each of the Likert-scale items in Part II is intended to measure one of the identified variables defining the concept of health motivation, as has been discussed. The items are scored on a scale of 1 to 5, where 1 is recognized as being positive for health motivation and 5 is negative. Negatively worded items are recoded by computer.

Finally, Part III should be analyzed separately. As stated earlier, this section is designed to determine the existence and the nature of the concept of a "catalyst" which serves to incite or motivate change. Each response in this section is reviewed and categorized as to the nature of the factor or catalyst that initiates the health promotional behavior. Trends are listed and outlined regarding whether the behaviors were changed primarily for health, cosmetic, social or other reasons. Resulting information is then reported.

Level of Measurement. The HMAI produces data primarily at the interval level, although some information generated is nominal. The demographic questions at the form's conclusion, as well as several questions in Part I designed to identify current health habits, are considered nominal.

The information produced from the Likert scale in Part II is considered ordinal by some researchers and interval by others. Shelley (1984) states that "according to current accepted practice, it (a Likert scale) yields interval level data, not ordinal, as too many textbooks suggest. The response scale of 1 to 4 for each item is assumed (sic) to represent an equal interval continuum and thus the sum of responses is considered interval data" (p. 37). Burns and Grove (1987) believe that values of items on a Likert scale

are "technically ordinal level data, the summed score is interval level data, thus allowing more sophisticated statistical analyses" (p. 319).

Miller (1970), on the other hand, states that the "Likert technique produces an ordinal scale which generally requires non-parametric statistics" (p. 92). Brink and Wood (1988) agree and list the Likert scale with other ordinal forms of measurement. Finally, Reckase (1984) states that the "level of scaling obtained from the Likert procedure is rather difficult to determine. The scale is clearly at least ordinal. . . and whether an interval scale is obtained depends on a strong assumption that the properties on the scaled variable have to correspond to differences in the trait on the natural variable . . . and this seems unlikely" (p. 52). Reckase concludes, however, by stating that the "level of scaling for this method is not an important issue. That is, treating the scores as if they were on an interval scale does not seem to cause serious harm" (p. 52).

Validity Issues

Content Validity and the HMAI

Waltz, Strickland and Lenz (1984) discussed the determination of content validity. They state that the process begins by supplying the list of objectives that guided the instrument's construction and a separate list of

items designed to specifically test the objectives to at least two experts in the area of the content to be measured. "These experts are then asked to (1) link each objective with its respective item; (2) assess the relevancy of the items to the content addressed by the objectives; and (3) judge if they believe the items on the tool adequately represent the content or behaviors in the domain of interest" (p. 142).

Initially, 10 to 12 items were written for each subscale of the HMAI. Following the completion of the first draft, the instrument was administered to a group of graduate nursing students to determine readability and to seek suggestions for clarification. Following this, suggested alterations were made in the instrument. To further estimate content validity, the questionnaire was mailed to a panel of four "experts" who had recently (within the last five years) published work related to motivation and health. Each panelist was a doctorally prepared nurse. Three of the four questionnaires were returned with evaluations. In addition to the questionnaire, each expert was provided the definition of the concept of health motivation and definitions for each subscale. She was asked to match each item with her choice as the appropriate subscale. The panelists were then invited to comment on

items they felt were ambiguous, unclear, or not appropriate. An item was retained if at least two of the judges identified it with the subscale for which it was initially written. Revisions were also made to increase clarity or change a positively worded item to make it negatively worded. The final instrument, which was used in the pilot study, was comprised of 17 questions (22 for women) for Part I, and 46 questions for Part II, with either eight or nine items for each subscale.

Construct Validity and the HMAI

As stated earlier, construct validity is "the degree to which a measurement strategy measures the construct it was designed to measure" (Burns and Grove, 1987, p. 296). It is the most complex method of validation in that it tests the theory, propositions, hypotheses and principles on which research is based (Brink and Wood, 1988). Construct validity is an on-going process and is established through using several different methods.

Factor analysis is listed as one method to be utilized to estimate construct validity. Factor analysis is performed on a data set to examine relationships between the various items of the instrument. Items that do not fall into a factor may be deleted (Burns and Grove, 1987).

Factor Analysis. Factor analysis is an "empirical data

reduction tool of great utility and power that clusters individual items into linear combinations called factors, thereby greatly reducing an instrument's complexity" (Waltz and Bausell, 1983, p. 299). Factor analysis can be used as an item selection device in instrument construction; to test or confirm a theory; to determine exactly what the instrument measures; and as a method for determining new dependent variables from subscores on an instrument (Tabachnick and Fidell, 1989; Waltz and Bausell, 1983 and Polit and Hungler, 1983).

Waltz and Bausell (1983) state that the first statistical step for factor analysis (accomplished by computer) consists of the construction of a matrix of intercorrelations between all items. The computer examines this matrix and manipulates it in such a way that "clusters" of items that tend to measure the same dimensions are identified. The end result is a "group of linear combinations of items called factors, each of which is independent of all other identified factors . . each factor is then correlated with each item to produce factor loadings (sic)" (Waltz and Bausell, p. 301).

To be able to distinguish between the identified variables, each identified subscale should contain at least three items which "load" at a level of .40 (Wilson, 1983).

This will then establish the existence of correlations between the individual items and the variables identified for the concept of health motivation.

Tabachnick and Fidell, (1989) state that as long as factor analysis is used descriptively as a way to summarize the relationships in a large set of variables, assumptions regarding normality of distribution are not applicable. Additionally, linearity is not essential, however, it enhances the analysis.

Research articles by Champion (1984), Cox (1985), Miller and Powers (1988) and Olivas (1984) describe the use of factor analysis in instrument development and theory testing. Each study presented item loadings and variable groupings to indicate how the various items supported (or failed to support) the theoretical framework. The HMAI was specifically developed to test the concept of health motivation, and measure the identified variable subscales. Factor analysis is necessary to indicate if the instrument measures and groups the items as designed.

Reliability and the HMAI

To assess internal consistency reliability of the HMAI, Cronbach's Alpha was utilized. The alpha coefficient is "the preferred index of internal consistency reliability" and "measures the extent to which performance on any one

item on an instrument is a good indicator of performance on any other item in the same instrument" (Waltz, Strickland and Lenz, 1984, p. 136).

Cronbach's Alpha Statistical Procedure. To compute the Cronbach's Alpha (alpha coefficient), the RELIABILITY procedure was performed using the SPSSX software. This procedure performs an item analysis on the components of additive scales by computing the coefficients of reliability (Norusis, 1983). Alpha coefficients of 0.8 to 0.9 are preferred, although 0.7 is considered acceptable for immature instruments (Nunnally, 1978). In addition to providing a total correlation, this procedure produced alpha levels for the subscales and indicated how each individual item interacted with its subscale and the total instrument.

Pilot Testing

The Setting. The setting for the pilot study was a large insurance company in a metropolitan area. One hundred copies of the questionnaire, complete with the cover letter, were provided by the researcher to be included as a part of a "Health Awareness Day" program scheduled by the company nurse. The program included booths set up by a number of local groups (Planned Parenthood, Alcoholics Anonymous), individual practitioners (dermatologists, chiropractors,

podiatrists) and companies (hospitals, health clubs, etc.). Screening procedures, such as finger sticks for blood glucose and cholesterol levels, and blood pressure checks were also provided. The tables were set around the walls of a very large room. The employees were encouraged to browse around the room and discuss the various subjects with the individuals at the booths. The HMAI forms, along with evaluation forms for the Health Awareness Day Program, were placed a both ends of a long table by the exit door. Pencils, clipboards and chairs were included for the respondents' convenience. There are twelve hundred employees at the site of the program, and all were provided opportunity by their immediate supervisors to view the exhibits. No one was specifically requested to complete the HMAI; the forms were available for all employees, and any who chose to participate completed the form and placed it in a box provided.

This setting was chosen for convenience and ease of execution. In addition, the study was conducted in an environment conducive to the participants' awareness of their health and when their interest was high. For future projects utilizing the HMAI, settings of this type are ideal, although not necessary. It is believed that excellent results can be obtained by providing the forms to

the participants through the company nurse to be completed in the privacy of their own offices or homes, or through other programs provided at the work-site.

The Subjects. As stated earlier, the HMAI was developed specifically for adults at work-site settings. For the pilot study describe here, 69 of the 100 forms provided were returned. Of these, 60 were usable. Verbal and written comments regarding the instrument were very favorable. Many stated that it was "interesting" or "informative" or "it made me think." The major negative response was with regard to the length of the form.

Power analysis, as described by Kraemer (1985) and Cohen and Cohen (1975), determined that the sample size for the pilot study was adequate. For the calculation, a Power Table utilizing 90% power, alpha at .05 and a "critical effect size" of .4 showed that a sample size of 60 would be appropriate. The critical effect size, according to Kraemer is "a measure expressed in terms of the proposed design and the population characteristics of how strong the theory must minimally be to be "important to society"" (p. 175). Thus, an effect size of .4, suggesting a medium difference or relationship between/among the variables, will indicate a significance at alpha of .05 and a power of .90.

Of the sample of 60 in the pilot study, 45 (75%) were

female. This was consistent with the demographics of the company. Additionally, 88% were white (all others were black); 65% were married, 18% single, 17% divorced or separated; 46% reported yearly family income of greater than $40,000, 17% reported incomes of between $10,000 and $20,000 and 17% between $30,000 and $40,000, leaving 20% reporting between $20,000 and $30,000. The mean age was 34.7 (again consistent with the company's demographics, according to the company nurse). Twenty-nine percent were college graduates or above and the remaining 71% had completed high school and/or some college.

Because the site selected provided a sample of white-collar (chiefly clerical) workers with at least a high school education, there appeared to be no problem with the clarity of the instrument. Less well-educated individuals, however, might have some difficulty understanding all of the items.

Reliability Results. To estimate the reliability of the HMAI, several alpha coefficients were assessed. Because the instrument was developed in three independent parts with the first two being subject to statistical analysis, alpha coefficients were estimated individually on Parts I and II. The reliability coefficient for Part I was .8926, which is considered excellent. For Part II, the alpha coefficient

was .6692, which approaches the .7 considered acceptable for new instruments. In addition, separate alpha coefficients were calculated for each of the five subscales and are depicted in Table 1.

Each subscale loading was then reviewed and items demonstrating very low correlations with their respective scales were deleted the procedure repeated. This resulted in raising all subscale alpha levels. Table 2 lists the corrected alphas.

TABLE 1

Pilot Test: Initial Subscale Alpha Coefficients

Subscale	Alpha Coefficient
Previous Knowledge (PK)	.689
Perceived Susceptibility/severity (PSS)	.061
Perceived Value of Action (PV)	.283
Internal Obstacles/aids (IOA)	.621
External Obstacles/aids (EOA)	.053
Total Scale (Part II)	.669

TABLE 2

Pilot Test: Corrected Subscale Alpha Coefficients

Subscale	Alpha Coefficient
Previous Knowledge	.689
Perceived Susceptibility/severity	.528
Perceived Value	.653
Internal Obstacles/aids	.658
External Obstacles/aids	.208

Although none of the subscale alpha values were greater than .7 as desired, three (PK, PV, and IOA) were all approaching that value. The alpha coefficient for the subscale EOA, however, remained very low indicating that much more work needed to be done on items designed to measure that subscale. Other items also needed review and revision and changes were made as deemed necessary.

Validity Results. To begin the estimation of construct validity of the HMAI, factor analysis was employed. While the sample size was insufficient for factor analysis, the SPSSX software program FACTOR was run to examine initial trends. The HMAI consistently discriminated within and between the subscales as indicated by the factor analysis. The subscale of PK had 7 items that loaded at or above the level of .40; PSS - 5 items; EOA - 6 items; PV - 6 and IOA - 6. Examples of items and their loading are listed below.

PREVIOUS KNOWLEDGE	LOADING.
2. I am aware of risk factors that effect the development of heart disease.	.6766
12. I know the symptoms of a heart attack.	.7573
26. I have read books and articles about heart disease and its causes and prevention.	.8320
40. I know what food to eliminate or reduce to lower my cholesterol.	.6959

PERCEIVED SUSCEPTIBILITY/SEVERITY	
1. I worry about having a hear attack.	.6636
3. There is a history of heart disease in my family.	.5872
18. I believe that my weight puts me at risk for a heart attack.	.8300
PERCEIVED VALUE OF ACTION	
4. I believe a regular exercise program improves cardiac fitness.	.7480
15. I believe preventative actions are effective in reducing heart disease.	.7537
34. I believe changing personal habits such as stopping smoking, reducing alcohol intake and regular exercise will improve my health.	.6746
INTERNAL AIDS/HINDRANCES	
17. I feel I have no control over the future.	.6388
22. I am optimistic about the future.	.7960
38. I feel I have control over my life.	.8385
EXTERNAL AIDS/HINDRANCES	
21. I have health insurance that will pay for screenings and routine physical examinations.	.5713

29. I don't have time to exercise regularly. .7780

37. I would exercise more regularly, but .4788
the weather is too hot in the summer and
too cold in the winter.

This procedure also served to identify items designed to measure a particular subscale that apparently were not related to that variable, and thereby were deleted. Overall, the items correlated very well with the intended subscales.

Changes in the HMAI and Readiness for Major Study

The primary area of change in the instrument involved the alteration of the subscale variable of perceived severity/susceptibility. After review of the theoretical framework and examination of the factor analysis for the pilot study, it was decided that this subscale should be divided into two separate variables, one of perceived severity and one of perceived susceptibility. Therefore, the relevant questions were reviewed to determine which variable (severity or susceptibility) was addressed and six more questions were written to produce a total of seven items for each subscale.

Other alterations included the examination of individual items and recoding two items in which a negative response indicated positive health motivation. The

regrouping of two items into different subscales following factor analysis, constituted another change following the pilot testing.

The revised HMAI was rewritten and type-set to give the instrument a professional appearance. The instrument was then reduced in size and converted into a booklet form prior to mass production. Finally, a new cover letter was written explaining the study to participants. A copy of the HMAI, as utilized in the study, is included in the Appendix.

Data Collection

The data for the present study was collected at two large manufacturing facilities in a large city in the southern United States. Five hundred questionnaires were printed and distributed as discussed previously. The forms were collected as they were completed, then examined and coded for data analysis.

Treatment of Data

Following data collection, the information obtained from the responses on the HMAI was coded and entered into a data set. This data set was then analyzed utilizing the statistical tests described earlier.

To test Hypothesis One (internal consistency reliability of Part I of the HMAI), Cronbach's Alpha was assessed (Nunnally, 1978; Burns and Grove, 1987; and Brink

and Wood, 1988). An alpha coefficient of 0.7 or greater determined the acceptance of H1.

Likewise, a Cronbach's Alpha of 0.7 or greater was utilized to determine the acceptance of Hypothesis Two, which measured the internal consistency of Part II of the HMAI. Hypothesis Three, dealing with the internal consistency reliability of each of the individual subscales, was also tested by application of Cronbach's Alpha. An alpha coefficient for each subscale of 0.7 was needed to determine the acceptance of H3.

Finally, Factor Analysis, was utilized to test Hypothesis Four. As has been documented, factor analysis is a statistical method utilized to begin estimation of construct validity (Burns and Grove, 1987; Tabachnick and Fidell, 1989; and Waltz and Bausell, 1983). To determine factorial validity for the HMAI, each item and its subscale was evaluated to determine "factor loadings" (Waltz and Bausell, 1983). Factor loadings of 0.4 on at least three items on each subscale served as verification of the correlations between the items and the subscales they were designed to measure (Wilson, 1985; Tabachnick and Fidell, 1989).

Summary

This chapter detailed the development of the Health Motivation Assessment Inventory, a research instrument designed to measure the concept of health motivation. Within this discussion, the procedure for estimation of content validity was presented. The pilot test was described and the results, which were largely favorable, were presented.

Procedures for sample selection, administration of the questionnaires, and collection and treatment of data were also described. A convenience sample, drawn from a group of employees at two large manufacturing companies were requested to complete the questionnaires. Following collection of the completed questionnaires, the methodology utilized to analyze the data was presented.

Chapter four will concentrate on the findings of the research study. A presentation of how the sample was achieved, description of the sample and a complete report of all findings will be included.

Chapter 4

ANALYSIS OF DATA

A methodological study for the purpose of development and testing of the Health Motivation Assessment Inventory (HMAI) was conducted to estimate reliability and validity. The data analysis for the HMAI was organized into a series of procedures. This process, including initial findings, modification, and final results, will be described in detail. Each hypothesis will then be examined with respect to the findings.

Description of Sample

The final sample for the present study consisted of 285 individuals employed in one of two large companies in a large metropolitan city in the southern U.S. Demographic data, including age, gender, race, income level, marital status and education level, are presented in Table 3. As the table depicts, the sample was largely white (91%), educated (50% college graduate), married (70%), and had a proportionately high income average (55% greater than $40,000/year). Males and females were fairly evenly represented, although females constituted a larger percentage (57%).

TABLE 3

Sample Demographic Variables

Variable		Percent
Mean Age	39	
Range 18 - 68	s.d. = 11.99	
Gender		
Males	n = 123	43.2%
Females	n = 162	56.8%
Race/Ethnic Group		
White	n = 260	91.2%
African-American	n = 12	4.2%
Hispanic	n = 9	3.2%
Oriental	n = 4	1.4%
Education Level		
Did not complete H.S.	n = 7	2.5%
High school diploma	n = 43	15.1%
Some college	n = 93	32.6%
College graduate	n = 142	49.8%
Family Income Level		
Less than $10,000/year	n = 7	2.5%
$10,001 - 20,000/year	n = 25	8.8%
$20,001 - 30,000/year	n = 46	16.1%
$30,001 - 40,000/year	n = 50	17.5%
More than $40,000/year	n = 157	55.1%
Marital Status		
Single (never married)	n = 54	18.9%
Married	n = 199	69.8%
Divorced/separated	n = 27	9.5%
Widowed	n = 5	1.8%

Findings

The purpose of the present study was to further develop and refine the HMAI and describe its psychometric properties. Reliability of the instrument was tested utilizing Internal Consistency Reliability (alpha coefficient). These findings contribute to the final analysis of Hypotheses One, Two, and Three. Analysis of Hypothesis Four was determined employing Factor Analysis which investigated the instrument's validity. Each will be discussed at length.

Initial Internal Consistency Reliability and the HMAI.

For initial statistical analysis, each individual item was grouped with other items written for the same subscale. The SPSS-X program RELIABILITY was then employed to determine alpha values on each subscale. In addition, separate alpha coefficients were determined for Part I and Part II of the instrument to assess the internal consistency of the entire instrument. The original alpha values for each subscale, as well as Parts I and II of the HMAI are presented in Table 4. Initial reliability analyses, including item numbers, item/total correlation, and "Alpha If Item Deleted" values, are presented for each subscale in Tables 5 through 10.

TABLE 4

Initial Internal Consistency Reliability Estimates

Part I (total)	65	.8898
Part II (total)	40	.6349

Subscale (Part II)	No. of Items	Alpha
Previous Knowledge	7	.6947
Perceived Susceptibility	7	.0292
Perceived Severity	6	.3179
Perceive Value of Action	6	.7028
Internal Aids/hindrances	7	.5049
External Aids/hindrances	7	.5125

TABLE 5

Internal Consistency Reliability - Previous Knowledge

Item Number	Item/total Correlation	Alpha if Item Deleted
2	.5147	.6442
5	.0521	.7222
7	.4695	.6421
8	.3924	.6743
12	.4323	.6535
26	.5434	.6176
40	.4333	.6535

TABLE 6

Internal Consistency Reliability - Perceived Susceptibility

Item Number	Item/total Correlation	Alpha if Item Deleted
1	.0715	-.0298
3	.3629	-.4425
10	.2039	-.1903
11	.1760	-.1589
18	-.2326	.2608
36	-.4067	.2891
39	-.0544	.0731

TABLE 7

Internal Consistency Reliability - Perceived Severity

Item Number	Item/total Correlation	Alpha if Item Deleted
6	.0982	.3119
19	.3068	.1950
25	.0730	.3262
29	.1894	.2419
30	.0640	.3389
32	.1750	.2534

TABLE 8

Internal Consistency Reliability - Perceived Value of Action

Item Number	Item/total Correlation	Alpha if Item Deleted
4	.3821	.6787
9	.3553	.6858
13	.3562	.6932
15	.5206	.6422
34	.5068	.6391
35	.5152	.6348

TABLE 9

Internal Consistency Reliability - Internal Aids/Hindrances

Item Number	Item/total Correlation	Alpha if Item Deleted
14	.2067	.4899
16	.3659	.4054
17	.2483	.4650
22	.1620	.4965
24	.1795	.5099
31	.3172	.4296
38	.2870	.4515

TABLE 10

Internal Consistency Reliability - External Aids/Hindrances

Item Number	Item/total Correlation	Alpha if Item Deleted
26	.1614	.5113
21	.2230	.4862
23	.3714	.4172
27	.2378	.4785
28	.3644	.4217
33	.1970	.4940
37	.1951	.4960

Following the initial determination of alpha values, each item, within each subscale of part II of the HMAI, was examined to determine the relationship of the item to the overall subscale. As can be seen in Tables 5 - 10, questions with item/total correlations less than .3 tended to decrease the Alpha Coefficient of their respective subscales. Each item was evaluated and retained or deleted based on the item/total correlation value. Items demonstrating low correlations (.3 or below) were omitted in an attempt to refine the alpha values, thereby improving internal consistency of the instrument.

In addition, one subscale, Perceived Susceptibility, had three negatively correlated items (Table 6). In reviewing these items, particular attention was directed to

those items. Each was recoded and re-evaluated. The item/total correlations, however, never reached a value greater than .15 and the items were eventually removed from the subscale.

Factor analysis involving all of the original items, was then performed to substantiate the groupings of the items within each subscale. This is discussed at length in the next section.

Factor Analysis Validity and the HMAI.

As stated in Chapter 3, Factor Analysis was utilized to begin estimation of construct validity for the Health Motivation Assessment Inventory. The SPSS-X program FACTOR was employed to perform the factor analysis. A command to "sort" the factor loadings was used and the factor matrix was rotated by Varimax Rotation. This procedure resulted in thirteen factors with loadings of multiple items of 0.40 or greater. Of these, eight contained three or more items. Factor 1 contained seven items; Factor 2 - five; Factors 3, 4, 5, 6, 8 and 11 - three items each. Review of the items supplied by the Factor Analysis showed that Factor 11 was not interpretable; the items had no apparent relevance. The items in Factor 6, on the other had, contained a common thread (two questions dealt with the benefit of open-heart surgery; one with control over life). Although this

grouping was somewhat consistent within itself, its value appeared to be of no importance with the remainder of the study and the questions were discarded. The remaining six factors correlated with the identified subscales and were used to sort the items for inclusion in the reliability testing described previously.

Final results of the Factor Analysis, including abbreviated forms of each question, are presented in Table 11. As can be seen in the table, the loadings for the items were fairly well correlated. Only two of the items (questions 9 and 40) were below .5; the remainder of the item loadings were well above the inclusion criteria of .4.

TABLE 11

Factor Loadings (Varimax Rotation) - HMAI

Factor (Corresponding Subscale) Item number and question	Loading
FACTOR 1 (Perceived Value of Action)	
34. I believe changing personal habits (smoking, alcohol intake, etc.) will improve my health.	.69662
4. I believe a regular exercise program improves cardiac fitness.	.68731
35. I believe eating a diet low in fat will improve my risk for heart disease.	.60332

(Table Continues)

15.	I believe preventative actions are effective in reducing heart disease.	.58777
5.	Personal habits such as smoking have a strong effect on cardiac risk.	.55843
14.	My health is important to me.	.51941
9.	I believe lowering stress can reduce chances of having a heart attack.	.42266
	FACTOR 2 (Previous Knowledge)	
26.	I have read books and articles about heart disease, its causes and prevention.	.76434
12.	I know the symptoms of a heart attack.	.70009
2.	I am aware of risk factors that effect the development of heart disease.	.61372
7.	I know my usual blood pressure.	.52723
40.	I know what foods to eliminate or reduce to lower my cholesterol.	.44414
	FACTOR 3 (Internal Aids/Hindrances)	
31.	I would like to lose weight but I often can't resist sweets or foods not on my diet.	.73292
18.	I believe my weight put me at risk for a heart attack.	.64245
16.	I find it hard to stay on a diet even if prescribed by my doctor.	.60230
	FACTOR 4 (External Aids/Hindrances)	
23.	I don't have time to exercise regularly.	.73310

(Table Continues)

24.	I don't enjoy exercising.	.70167
37.	My spouse really helps me when I'm dieting.	.53254

FACTOR 5 (Perceived Susceptibility)

3.	There is a history of heart disease in my family.	.71469
10.	Diabetes runs in my family.	.70364
11.	High blood pressure runs in my family.	.69186

FACTOR 8 (Perceived Severity)

29.	I believe a heart attack would endanger my career.	.71009
32.	A heart attack would change how people treat me.	.69947
19.	A heart attack would change my life drastically.	.51380

Final Internal Consistency Reliability Coefficients.

Items that failed to achieve factor correlations greater than the criteria of 0.4 for each subscale were compared to those deleted through examination of alpha values. The two techniques identified the same items as being problematic. Items which did not appear to belong in any subscale were eventually removed from the questionnaire.

Following the numerous comparisons and re-groupings designed to increase alpha coefficients, it was determined

the maximum reliability attainable was established for each subscale for this study, while leaving the maximum number of items per subscale. The resulting reliability estimates for each subscale are presented in Tables 12 through 17.

TABLE 12

Previous Knowledge -

Final Internal Consistency Reliability

Item Number	Item/total Correlation	Alpha if Item Deleted
2	.5007	.6925
7	.4941	.6849
8	.4189	.7172
12	.4624	.6952
26	.5290	.6737
40	.4505	.6982
Final Subscale Alpha Coefficient (PK)		.7310

TABLE 13

Perceived Severity -

Final Internal Consistency Reliability

Item Number	Item/total Correlation	Alpha if Item Deleted
19	.3310	.5298
29	.3806	.4486
32	.4259	.3689
Final Subscale Alpha Coefficient (SEV)		.5611

TABLE 14

Perceived Susceptibility -

Final Internal Consistency Reliability

Item Number	Item/total Correlation	Alpha if Item Deleted
1	.2780	.5731
3	.4888	.4018
10	.4304	.4566
11	.2693	.5840
Final Subscale Alpha Coefficient (PSS)		.5821

TABLE 15

Perceived Value of Action -

Final Internal Consistency Reliability

Item Number	Item/total Correlation	Alpha if Item Deleted
4	.5027	.7250
5	.4354	.7391
9	.4306	.7400
14	.5122	.7148
15	.5607	.7148
34	.4890	.7286
35	.4686	.7385
Final Subscale Alpha Coefficient (PV)		.7598

TABLE 16

Internal Aids/Hindrances -

Final Internal Consistency Reliability

Item Number	Item/total Correlation	Alpha if Item Deleted
16	.4477	.4983
18	.3993	.5353
31	.4740	.4741
Final Subscale Alpha Coefficient (IAH)		.6330

TABLE 17

External Aids/Hindrances -

Final Internal Consistency Reliability

Item Number	Item/total Correlation	Alpha if Item Deleted
23	.3911	.5254
24	.4146	.5075
27	.2839	.6002
37	.4509	.4840
Final Subscale Alpha Coefficients (EAH)		.6026

These tables (12 to 17) reveal that Alpha Coefficients were maximized in five of the six subscales (PK, SEV, PV, IAH and EAH), with removal of any of the items lowering the overall alpha. In the remaining subscale (PSS), one item (11) was retained that actually lowered the reliability; although the difference was minimal.

The final subscale alpha coefficients, along with the cumulative alpha for Part II, are depicted in Table 18. This table indicates the two subscales with the most questions included in the final reliability test had the highest alpha coefficients. Similarly, those with only three and four items failed to achieve the desired alpha.

Ideally, there would be an equal number of items (minimum 5) in each subscale. This will be discussed in greater detail in Chapter 5.

TABLE 18

Final Internal Consistency Reliability Estimates

Subscale	No. of Items	Alpha
Previous Knowledge	6	.7310
Perceived Susceptibility	4	.5821
Perceived Severity	3	.5611
Perceive Value of Action	7	.7598
Internal Aids/hindrances	3	.6330
External Aids/hindrances	4	.6026
PART II (total)	27	.7086

Summary of Normative Statistics - Final Scale

Table 19 contains the summary of normative statistics for Part II subscales. This data will be useful in further interpretation and explanation of subscale findings. The table shows item means less than 3 or "neutral" for four of the six subscales indicating that respondents, overall, tended to "agree" or "strongly agree" with these statements.

Interestingly, the subscales with the highest alpha coefficients (PV and PK) also had the lowest item means, as well as the lowest item standard deviations. Possible ranges were broad in each of the subscales, indicating that individuals varied in their responses to the items.

TABLE 19

Summary of Normative Statistics - Revised HMAI

Scale	N	Mean	S.D.	Item Mean	Item s.d.	Range (poss range)
PK	6	12.28	3.897	2.05	.65	6 - 27 (6 - 30)
PSS	4	12.36	3.44	3.09	.86	4 - 20 (4 - 20)
SEV	3	6.67	2.31	2.22	.77	3 - 13 (3 - 15)
PV	6	10.36	2.95	1.73	.49	10 - 25 (7 - 35)
IAH	3	8.76	2.97	2.92	.99	3 - 15 (3 - 15)
EAH	4	14.23	3.33	3.58	.83	6 - 20 (4 - 20)

Analysis Results and Hypotheses One, Two and Three

From the information presented in Table 18, conclusions were made on the results of hypotheses one, two and three. These will be discussed individually.

H1. The internal consistency reliability for Part I of the Health Motivation Assessment Inventory is greater than or equal to 0.7.

The internal consistency reliability for Part I of the HMAI was .8898 as presented in Table 4, therefore Hypothesis 1 was accepted. The original intent of Part I of the HMAI was to determine the motivations of health behaviors in general, and to be utilized as a source of data for further analysis with Part II. Following original statistical analysis, no modifications to Part I were made, thus the initial alpha coefficient was used in the analysis of H1.

H2. The internal consistency reliability for Part II of the Health Motivation Assessment Inventory is greater than or equal to 0.7.

Hypothesis 2 was accepted. Through in-depth analysis of the relationship of each item on the questionnaire to each subscale, and to Part II as a whole, several ineffective

items (12) were deleted. This resulted in the Alpha value for Part II being raised from .6349 (Table 4) to .7086 as shown in Table 18.

H3. The internal consistency reliability for each of the subscales of Previous Knowledge, Perceived Susceptibility, Perceived Severity, Internal Aids/Hindrances, External Aids/Hindrances, and Perceived Value is greater than or equal to 0.7.

Hypothesis 3 was rejected. The process of refining each of the HMAI's subscales was presented earlier. Through scale revision and item deletion, the alpha value for each subscale was increased. Although two subscales (PK and PV) produced alphas greater than required, the remainder did not. Each subscale and the original and final alpha values are summarized in Table 20. While improvement has been made, further development of the instrument will be directed at improving the reliability of the subscales and the instrument.

TABLE 20 Comparison of Subscale Alpha Values

Subscale	Initial Alpha	Final Alpha
Previous Knowledge	.6947	.7310
Perceived Susceptibility	.0292	.5821
Perceived Severity	.3179	.5611
Perceive Value of Action	.7028	.7598
Internal Aids/Hindrances	.5047	.6112
External Aids/Hindrances	.5125	.6026

Analysis Results and Hypothesis Four

The findings presented in Table 11 were employed in the review of hypothesis 4.

H4. Previous knowledge, perceive value, perceived severity, perceive susceptibility, external aids/hindrances, and internal aids/hindrances are factors related to the concept of health motivation indicated by at least three items for each subscale attaining factor loadings of .40 or greater.

Hypothesis 4 was accepted. Review of Table 11 indicated that there are three items loading at .40 or greater on four of the subscales (Perceived Severity, Perceived Susceptibility, Internal Aids/Hindrances, External Aids/Hindrances). In addition, there are five items that meet the criteria on the subscale of Previous Knowledge and seven items on the Perceived Value of Action subscale.

Summary of Findings

The data analysis of the present study on the development of the Health Motivation Assessment Inventory produced largely favorable results. Final internal consistency reliability coefficients supported the instrument as whole. Alpha levels for Parts I and II, individually, were greater than the reference criteria of 0.7. Additionally, alpha values for two of the six subscales were in excess of 0.7. Of the four remaining subscales, two were over 0.6 and two were greater than 0.55; thus none was completely without support.

Of the three hypotheses addressing the instrument's reliability, two (H1 and H2) were supported. The third hypothesis (H3) was rejected.

Factor analysis was utilized to support the construct

validity of the instrument. Hypothesis four was supported as a minimum of three items factored at loadings greater than 0.4 for each subscale. This produced a final scale (Part II) consisting of 27 items divided among the six subscales.

Chapter five will discuss study findings in further detail. Included will be conclusion and implications derived from the data analysis of the study as well as recommendations for further study.

CHAPTER 5

SUMMARY OF THE STUDY

The problem of this study focused on the determination and validation of the variables that produce and influence the motivation of health promotional behaviors in working adults. The purpose of the study was to examine the psychometric properties of the researcher developed instrument, The Health Motivation Assessment Inventory (HMAI). To this end, four hypotheses were proposed. These hypotheses examined the statistical support for beginning validity and reliability estimates for the instrument. Of the four hypotheses, three were accepted, the fourth was rejected. Thus, the psychometric properties of the instrument, at least partially, substantiate its ability to measure the construct of Health Motivation and provide impetus for further development.

This chapter summarizes and discusses the findings of the study. Conclusions, implications and recommendations for further study will be provided.

Summary

A methodological study was conducted to initiate estimation of reliability and validity for the Health

Motivation Assessment Inventory (HMAI). Following content analysis by a "Panel of Experts," the instrument was piloted using a worksite setting to gather subjects for the sample population. Preliminary reliability/validity studies were promising, and the instrument was modified and further developed for the present study.

The modified instrument was type-set and reproduced in a booklet form. Five hundred copies of the instrument were distributed at two separate settings. Over a three week period, the questionnaires were given to potential participants by the Occupational Nurse at one site, and a member of the committee on corporate fitness at the other. Completed questionnaires were returned to the contact individual and then to the researcher. Of the original 500 copies, 293 were returned; of these, 8 were unusable. Thus, the final study sample consisted of a convenience sample of 285.

The questionnaires were then coded and statistically analyzed. To assess internal consistency reliability, alpha coefficients were calculated: Separate alphas were derived for each of the two parts of the questionnaire as well as each subscale. The hypotheses (H1 and H2) which stated the reliability values for Part I and Part II would exceed 0.7 were supported as they attained reliabilities of .8898 and

.7086, respectively.

Hypothesis 3 was rejected. Desired alpha values of greater than 0.7 were attained on only two of the six subscales (Previous Knowledge and Perceived Value of Action). However, two other subscales, Internal Aids/Hindrances and External Aids/Hindrances exceeded 0.6, and the final two (Perceived Susceptibility and Perceive Severity) were above .55.

Hypothesis 4 utilized Factor Analysis to estimate construct validity and was accepted. The factor analysis "sorted" eight "factors" containing at least three items with a value of .40 or greater. Of these, two were uninterpretable or inconsistent with the design of the questionnaire. The remaining six correlated with the subscales and were used when grouping the items for the reliability studies.

Discussion of Findings

The acceptance of three of the hypotheses lends support for construct validity and internal consistency reliability of the HMAI. Each hypothesis, and its relevant placement within the instrument will be examined here.

Hypothesis 1.

Hypothesis 1 dealt with the internal consistency reliability of Part I of the HMAI. An alpha level of .8898

was achieved with no modifications, therefore it is concluded that this part of the instrument possesses a very high degree of internal consistency.

Part I of the instrument was devised to be used in conjunction with Part II, as well as to serve as a data gathering device in itself. Certain questions (2, 3, 6, 7, 9, 16, 18, 19 and 22) were developed to ascertain current health promotional and preventative practices. The intent of the instrument design was to utilize the results of these questions to study correlations between both positive and negative health practices, and the six subscales measured in Part II. With only minor modifications (such as adding an option of "I don't' desire to stop smoking" to question #1 or "diabetes" to question #13), Part I of the HMAI is prepared for employment in other research studies.

Hypothesis 2.

Hypothesis 2 concerned the internal consistency reliability of Part II of the HMAI. Again, Hypothesis 2 was accepted as Part II achieved an alpha value of .7086. Although the alpha was acceptable, it was only minimally so. It is hoped that addition and modification of questions for several of the subscales with lower alpha values will improve the internal consistency for Part II, as well as the individual subscales. This will be addressed further in the

next section.

Hypothesis 3.

This hypothesis was more problematic to analyze. Obviously, the questions for the subscales of Previous Knowledge (PK) and Perceived Value of Action (PV) were appropriate and appeared to validate and measure the existence of these variables in relation to health motivation. This was expected, however. Information gleaned from the literature review supported the importance of both variables in producing positive health practices; i.e., there must be some degree of knowledge or understanding of a health threat and how to remove or reduce it, as well as, a perception of value of taking action against it.

The other variables, as measured by the HMAI, are not as certain. Although there is some statistical support (in the form of alpha values and factor analysis) the questions do address separate components or variables for the overall construct, the evidence is not impressive. The literature supports that the perception of susceptibility and severity of a health threat (PSS and SEV, respectively) as well as internal and external aids and hindrances (IAH and EAH) will influence health behaviors. The task at hand is how to write questions that will corroborate and measure these

variables.

For each of the subscales listed, several questions (in many cases the better questions) failed to factor as designed and decreased alpha levels. Examples are: 21) I have health insurance that will pay for screenings and routine physical examination (EAH); 25) I know some who has died from a heart attack (SEV); 33) My spouse really helps and encourages me when I am dieting (EAH); and 38) I feel I have control over my life (IAH). Each of these (as well as other questions) were recoded (negatively coded) and the statistics rerun. There was no improvement, and the questions were discarded.

The final questionnaire consists of 27 questions on Part II. These are separated by subscale as follows: (PK) - 6 items; (PV) - 7; (PSS) and (EAH) - 4 each; and (IAH) and (SEV) - 3 each. Ideally, there would be five or six items for each subscale. Rewording certain questions, or writing new questions, should improve alpha levels and thus substantiate the importance of each variable in health motivation. For example, question 38 might be changed to read "I feel I have no control over my <u>health</u>" to make it more pertinent. Question 33 could be changed to remove the word "spouse" which could alter the responses of those people who are not married. These changes should be made

prior to further use of the instrument in research studies.

Most importantly, new questions need to be written for the four subscales with low alpha values. A minimum of six new questions should be developed for inclusion in a revised HMAI.

Hypothesis 4.

The "sort" command for the SPSS-X program Factor Analysis was extremely helpful in determining the groupings of the questions within their respective subscales. As has been discussed, the subscales of PV and PK were highly supported by both the reliability values and factor analysis, and they were included in the final instrument largely as initially written.

The other four subscales proved to be more of a challenge. For example, question 1) "I worry about having a heart attack," was written for the subscale of PSS. Although this question did not factor on that subscale, it was retained when computing alpha, as it appeared to convey the intent of the subscale. Fortunately, it did not reduce the subscale alpha.

Reduction of each of the four low-alpha subscales to three or four items through factor analysis was not desired. In addition, some items did not have sufficient loadings to be included in any subscale, and with the exception of the

item mentioned, they were deleted. On re-examination, several of these items were confusing or unclear, or were difficult to code, and were removed. Examples of these question are:

36) Heart disease runs in my family, and I feel I will eventually have a heart attack no matter what precautions I take.

39) I don't believe that smoking will cause me to have a heart attack because my grandfather (father, mother, etc.) smoked for years and never had heart problems.

30) I believe that medical science can cure or manage heart disease once it occurs, through surgery or medication.

Overall, the factor analysis was very helpful in identifying ineffectual questions and valuable in grouping items. Finally, as evidenced by the acceptance of H4, it assisted in demonstrating the beginning of construct validity for the HMAI.

Conclusions and Implications

It appears the HMAI has potential as a useful tool for data collection and research on the subject of motivation of health promotional behaviors. However, more revision and refinement would be beneficial before undertaking another large-scale study. Several of the items, as already

discussed, might be re-worded for clarity. Other items need to be written for the subscales containing only three or four questions.

Following successful modification of the instrument, its utility in testing the theoretical framework will be invaluable. The Health Motivation Model, as presented in Chapter 1, attempts to explain the motivation of health promotional behaviors. Adequate explanation of the variables that comprise health motivation, through model testing, will work to illustrate the relative importance of the model variables and direct productive intervention by nurses and other health care workers.

Recommendations for Further Study

The following recommendations for future study were identified:

1. Further refinement of the instrument through the writing of new items and modification of existing items already discussed.
2. Further statistical examination utilizing the same tests employed here, as well as other aspects of reliability and validity including:
    a. test/retest reliability for stability.
    b. estimation of convergent or discriminate validity by comparison of the results of the

HMAI with a similar instrument such as those mentioned in Chapter 2.

3. Following refinement of the instrument, analysis of the results by Multiple Regression, Canonical Correlations or MANOVA should be undertaken to study the relationships between the subscales and between the subscales and the modifying factors (demographic variables).
4. Testing and comparison of different populations, on the basis of age, geographic location, education level, chosen profession, etc., to ascertain differences in the motivation of health promotional between and among these groups.

Summary

Instrument development is a long process. This study represents a beginning in the development of the Health Motivation Assessment Inventory. Results of the study are encouraging and strongly support further pursuits in the development of the instrument following the suggestions included in Chapter 5.

Continued study of the construct of Health Motivation is very important as discussed in Chapter 1. Nursing's understanding of the whys of individual health promotional

behaviors can assist in producing more effective intervention thereby improving the overall health of many.

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APPENDICES

APPENDIX A

Prospectus Approval (Nursing)

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

PROSPECTUS FOR DISSERTATION

This prospectus proposed by: Melanie McEwen

_____ and entitled:

Health Motivation: Instrument Development

Has been read and approved by the members of (his/hers) Research Committee.

This research is (check one):

__X__ Is exempt from Human Subjects Review Committee review because the research is a survey of adults and does not contain information of a sensitive nature.

_____ Requires Human Subjects Review Committee review because _____

Research Committee:

Chairperson _____

Member _____

Member _____

Member _____

Member _____

APPENDIX B

Prospectus Approval (Graduate)

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON
THE GRADUATE SCHOOL
P.O. Box 22479, Denton, Texas 76204 817/898-3400, 800-338-5255

March 19, 1990

Ms. Melanie McEwen
9907 Hickory Crossing
Dallas, TX 75243

Dear Ms. McEwen:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,

Leslie M Thompson

Leslie M. Thompson
Dean for Graduate Studies
and Research

dl

cc Dr. Linda Harrington
Dr. Helen Bush

APPENDIX C

Agency Permission

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY

SGS Thomson Microelectronics grants Melanie McEwen, RN,MN, a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Health Motivation: Instrument Development

The conditions mutually agreed upon are as follows:

1. The agency may not be identified in the final report.
2. The names of consultative or administrative personnel in the agency may be identified in the final report.
3. The agency wants a conference with the student when the report is completed.
4. The agency is willing to allow the completed report to be circulated through interlibrary loan.

Date: March 8, 1990

Signature of Agency Personnel

Signature of Student

Signature of Faculty Advisor

cc SGS Thomson Microelectronics
TWU College of Nursing

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY

Fina Oil and Chemical Co. grants Melanie McEwen, RN,MN, a student enrolled in a program of nursing leading to a Doctoral Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

Health Motivation: Instrument Development

The conditions mutually agreed upon are as follows:

1. The agency may not be identified in the final report
2. The names of consultative or administrative personnel in the agency may not be identified in the final report.
3. The agency wants a conference with the student when the report is completed.
4. The agency is willing to allow the completed report to be circulated through interlibrary loan.

Date: 3/2/90

Signature of Agency Personnel

Melanie McEwen
Signature of Student

Signature of Faculty Advisor

cc Fina Oil and Chemical Co.
TWU College of Nursing

APPENDIX D

Consent to Participate

March 1, 1990

Dear Participant,

I am a Doctoral Student at Texas Woman's University in the College of Nursing. The focus of my study is on motivation, particularly the motivation of health-related practices. In an attempt to further understand why people do or do not practice what they believe might be beneficial to their health, I have developed this questionnaire. It is designed to help explain motivation with regard to health and assumes that many activities or actions that are believed to improve or promote health are taken for other reasons (for example, an individual may lose weight to look better instead of improving their health or might wear seatbelts because of the law rather than safety). Information gained from completed forms will be analyzed to determine trends that might help nurses, and other health professionals, gain insight into ways to encourage changes in lifestyles that will promote health.

Completion of this questionnaire is strictly voluntary. In addition, the return of a completed form will indicate consent to participate in the study. All instructions are contained on the questionnaire and responses are to be anonymous. Your participation is greatly appreciated.

Thank you,

Melanie McEwen, R.N., M.N.
Doctoral Candidate
Texas Woman's University
College of Nursing
Denton, Texas

APPENDIX E

The Health Motivation Assessment Inventory

HEALTH MOTIVATION

ASSESMENT INVENTORY

HEALTH MOTIVATION ASSESSMENT INVENTORY

Part I - Please Indicate your response by circling the most appropriate response to each question. There is no "right" or "wrong" answer. If more than one answer is appropriate, rank your choices - 1st for the primary reason, 2nd, 3rd, etc. If you choose a response labeled "other", please specify.

1. I quit (would like to quit) smoking:
   a. to improve my health.
   b. because it is expensive.
   c. because of pressure from my spouse or family.
   d. because of pressure felt at work and elsewhere.
   e. I have never smoked.

2. I smoke:
   a. less than one pack of cigarettes per day.
   b. 1 to 2 packs of cigarettes per day.
   c. more than 2 packs of cigarettes per day.
   d. I don't smoke.

3. I drink alcoholic beverages:
   a. never.
   b. less than once a month
   c. less than once a week.
   d. once or twice each week.
   e. three or four times each week.
   f. daily.

4. I would like to lose weight:
   a. to improve my appearance.
   b to please my spouse.
   c. to improve my health.
   d. I am comfortable with my weight.
   e. other _____

5. I would like to exercise regularly:
   a. to lose/maintain weight.
   b. to improve/maintain cardiovascular fitness.
   c. to increase my energy level.
   d. to relieve stress.
   e. I don't desire regular exercise.
   f. other _____

6. I exercise regularly for 20 minutes or more:
   a. less than once each week.
   b. 1 or 2 times each week.
   c. 3 times each week.
   d. 4 or more times each week.

7. I believe my diet is:
   a. excellent - I regularly eat fruits and vegetables; eat sparingly of fatty foods, salt and sweets; and eat three meals per day.
   b. good - I usually eat balanced meals and try to limit my intake of foods that have low nutritional value.
   c. fair - I occasionally eat well balanced meals, but frequently eat foods with low nutritional value.
   d. poor - I rarely eat balanced meals.

8. My diet needs improvement:
   a. because I prefer to eat sweets such as candy, cakes and doughnuts.
   b. because I prefer to eat meals that are convenient ("fast food" such as hamburgers, french fries, pizza, etc.)
   c. I frequently skip meals because I'm too busy.
   d. I am usually able to eat two or three balanced meals per day.
   e. other _____

9. With regard to my weight, I believe that I am:
   a. about right.
   b. too low.
   c. less than 15 pounds overweight.
   d. 15 - 30 pounds overweight.
   e. more than 30 pounds overweight.

10. When I am sick, I usually:
   a. don't go to the Doctor because I know what's wrong and I will be well in a few days.
   b. don't go to the Doctor because it's too expensive.
   c. don't go to the Doctor because it's too much of a hassle and I don't have time.
   d. go to the Doctor to find out what is wrong and seek treatment.
   e. other _____

11. I believe that knowing my cholesterol level:
    a. Is important because high cholesterol may contribute to heart disease.
    b. Is important but I haven't had an opportunity to have mine checked.
    c. is not Important for me because I don't believe that I will have a heart attack.
    d. is not important because a high cholesterol level is not a good Indicator of risk of having a heart attack.
    e. is not important to me because I will eat what I want regardless of my cholesterol level.

12. If I discovered my cholesterol level was high, I would:
    a. see my doctor and follow his advice.
    b. do nothing.
    c. cut back on eating foods that are high in fat.
    d. have the test done again.
    e. other _____

13. I worry most about getting:
    a. heart disease.
    b. cancer.
    c. AIDS.
    d. a chronic degenerative disease such as Alzheimer's
    e. I don't worry about getting Ill.
    f. other _____

14. I am concerned about the illness in question #13 because:
    a. I have a family history of the illness.
    b. I have a close friend or family member that has had it and I know how It effected them.
    c. I have some "risk factors" or symptoms associated with that illness.
    d. I have heard and read about it frequently.
    e. not applicable.
    f. other _____

15. I wear my seatbelt because:
    a. it's required by law.
    b. to reduce or eliminate injury in case of an accident.
    c. as an example to my children.
    d. I don't wear my seatbelt.

16. I wear my seatbelt:
    a. all of the time.
    b. most of the time.
    c. occasionally.
    d. rarely.
    e. never.

17. I sometimes don't take prescriptions as my doctor orders because:
    a. they may cause undesirable side effects.
    b. they are too expensive.
    c. I don't really understand what they are supposed to do and how long to take them.
    d. the symptoms are gone, and I feel the medication is no longer necessary.
    e. I always take prescriptions as ordered.

Questions 18 - 22 for women only.

18. Each month:
    a. I regularly examine my breasts to determine if there are any lumps or changes.
    b. I usually don't examine by breasts because I am afraid that I may find a lump.
    c. I usually forget to examine my breasts.
    d. I don't examine my breasts because I don't know if it is important or I don't know how.

19. If I noticed a lump in my breast, I would:
    a. immediately make an appointment to see my doctor.
    b. wait a few weeks to see if it remained and see a doctor if it did not go away.
    c. put off going to the doctor because of fear of cancer.
    d. ignore it.

20. I have had a mammogram because:
    a. it is a good way to recognize breast cancer early.
    b. my doctor recommended it because of my age (over 40).
    c. I had a lump in my breast.
    d. I have never had a mammogram.

21. I have never had a mammogram:
    a. because of my age.
    b. because of the expense.
    c. because it has never been available or suggested to me.
    d. because I have never found a lump in my breast.
    e. I have had a mammogram.

22. I go to my Doctor for a pap smear:
    a. regularly each one to two years.
    b. only if I am experiencing a problem with my menstrual periods or menopause.
    c. I rarely go because it's too expensive or too time consuming.
    d. very rarely because I never have problems.
    e. I have never had a pap smear.

Part II - The following statements are related to Heart Disease (heart attack, angina), its risk factors (such as family history, high blood pressure, high cholesterol, obesity) and possible preventative actions (weight control, diet, exercise). Please answer each question by circling the appropriate letters indicating how you respond to the statement. Mark

"SA" if you STRONGLY AGREE
"A" if you AGREE
"N" if you DON'T KNOW or NOT APPLICABLE
"D" if you DISAGREE
"SD" if you STRONGLY DISAGREE

with the statement. Again, there are no "right" or "wrong" answers.

1.	I worry about having a heart attack.	SA A N D SD
2.	I am aware of risk factors that effect the development of heart disease.	SA A N D SD
3.	There is a history of heart disease in my family.	SA A N D SD
4.	I believe a regular exercise program improves cardiac fitness.	SA A N D SD
5.	Personal habits such as smoking and excessive alcohol intake have a strong effect on cardiac risk.	SA A N D SD
6	I believe that coronary bypass surgery (open-heart surgery) can cure heart disease.	SA A N D SD
7.	I know my usual blood pressure.	SA A N D SD

8.	I know my cholesterol level.	SA A N D SD
9.	I believe that lowering personal stress levels can reduce chances of having a heart attack.	SA A N D SD
10.	High blood pressure (hypertension) runs in my family.	SA A N D SD
11.	Diabetes runs in my family.	SA A N D SD
12.	I know the symptoms of a heart attack.	SA A N D SD
13.	I believe that my health will improve if I follow my doctor's recommendations.	SA A N D SD
14.	My health is important to me.	SA A N D SD
15.	I believe preventative actions are effective in reducing heart disease.	SA A N D SD
16.	I find it hard to stay on a diet that is low in salt, fat or calories, even if prescribed by my doctor.	SA A N D SD
17.	I feel I have no control over the future.	SA A N D SD
18.	I believe that my weight puts me at risk for a heart attack.	SA A N D SD
19.	A heart attack would change my life drastically.	SA A N D SD
20.	My employer provides health programs to help me learn about health and screen for problems.	SA A N D SD

21. I have health insurance that will pay for screenings and routine physical examinations. SA A N D SD

22. I am optimistic about the future. SA A N D SD

23 I don't have time to exercise regularly. SA A N D SD

24. I don't enjoy exercising. SA A N D SD

25. I know someone who has died from a heart attack. SA A N D SD

26. I have read books and articles about heart disease and its causes and prevention. SA A N D SD

27. I would like to lose weight, but my spouse (or _____) hinders me. SA A N D SD

28. I have a convenient place to exercise. SA A N D SD

29. I believe that a heart attack would endanger my career. SA A N D SD

30. I believe that medical science can cure or manage heart disease once it occurs, through surgery or medication. SA A N D SD

31. I would like to lose weight but I often can't resist sweets or foods not on my diet. SA A N D SD

32. A heart attack would change how people treat me and act around me. SA A N D SD

33. My spouse really helps and encourages me when I am dieting. SA A N D SD

34. I believe changing personal habits such as stopping smoking, reducing alcohol intake and regular exercise will improve my health. SA A N D SD

35. I believe that eating a diet low in fat will improve my cholesterol level and improve my risk for heart disease. SA A N D SD

36. Heart disease runs in my family, and I feel I will eventually have a heart attack no matter what precautions I take. SA A N D SD

37. I would exercise more regularly but the weather is too hot in the summer and too cold in the winter. SA A N D SD

38. I feel I have control over my life. SA A N D SD

39. I don't believe that smoking will cause me to have a heart attack because my grandfather (father, mother, etc.) smoked for years and never had heart problems. SA A N D SD

40. I know what foods to eliminate or reduce to lower my cholesterol. SA A N D SD

41. What is your age? _____

42. Sex:
    a. male.
    b. female.

43. Race/ethnic group:
    a. white.
    b. African-American.
    c. Hispanic.
    d. Oriental.
    e. other._____

44. Education level:
    a. did not complete high school.
    b. high school diploma.
    c. some college.
    d. college graduate.
    e. post-graduate.

45. Family income level:
    a. less than $10,000 per year.
    b. 10,000 - 20,000
    c. 20,001 - 30,000
    d. 30,001 - 40,000
    e. more than 40,000 per year.

46. Marital status:
    a. single (never married).
    b. married.
    c. divorced.
    d. separated.
    e. widowed.

Part III. For this section, think of a specific example of when you modified your normal lifestyle to do something to promote your health (for example: lose weight, start an exercise program, stop smoking). Briefly describe what caused you to take that particular action at that time (for example: you saw a picture of yourself in a swimsuit; a friend younger than you had a heart attack; you discovered your cholesterol level was too high).