

THE BEHAVIORAL INTENT MODEL AND EXERCISE:  
A STUDY OF ATTITUDES, INTENT, AND BEHAVIOR

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We hereby recommend that the      dissertation      prepared under  
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## DEDICATION

This dissertation is dedicated to my husband, Stephen. He supported me every step of the way and guided me through the arcane statistics needed to complete the work.

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## CHAPTER 1

### INTRODUCTION

Voluntary behaviors which lead to the maintenance or promotion of health are receiving increasing emphasis in the health care arena. Such actions fall under the rubric of self-care activities (Levin, 1976, 1977, 1978) or preventive health behaviors (Kasl and Cobb, 1966; Rosenstock, 1974a). The impetus for this interest in preventive health behavior comes from at least two sources. First, chronic diseases have replaced acute illnesses as the most pressing health problem in the United States. It is estimated that 50 percent of our population suffers from one or more chronic conditions and that such disorders account for 70 percent of all visits to physicians (Gartner and Reissman, 1966). The amount of money spent to combat ill health is staggering. Approximately \$200 billion, or 8 percent of the gross national product, was spent on medical care in 1979 and this figure is now approaching 10-12 percent of the gross national product (Thomas, 1979). Yet, there is evidence that most chronic diseases cannot be cured by large expenditures on medical care. Chronic conditions are more responsive to prevention or control through patterns of behavior on the part of the individual than to cure through actions of the health care provider (Thomas, 1979).

The second stimulus for interest in preventive health behavior arises from a growing concern about the increasing reliance of society upon medicine (Illich, 1976; Somers & Somers, 1977). Arguing against

the idea that more and more medical care will produce healthier people, Knowles (1977) writes that the health of human beings is determined by their behavior, their food, and their environment. He concludes that the solution to the problem of ill health lies not in more medical care but in individual and social actions to ensure health-promoting lifestyles in a healthy environment (Knowles, 1977). Because healthful lifestyles are related to health, and because many chronic diseases stem from unhealthful living habits, Wikler (1978) suggests that changing health-related living patterns may be the most powerful and cost-effective way to improve the health of the public. Lifestyle reform seems to be the logical successor to earlier public health programs focusing on environmental concerns (1978). However, preventive health behaviors are voluntary and an individual may decide for himself whether or not to engage in one or more health-related activities. The quality of health practices varies widely. Some persons participate in a number of health-promoting activities. Others, although aware of the risks of cigarette smoking, obesity, and sedentary living, continue to live a health-damaging lifestyle. There is a need to learn why some people behave preventively and to encourage others to do so (Williams and Weschler, 1972).

#### Problem of Study

The problem addressed in this study is the relationship between selected variables and the decision to engage, or not to engage, in a specific health-promoting behavior--physical exercise. The relationship

between these variables and the self-reported performance of exercise is also explored.

### Justification of Problem

Given certain preconditions to health such as clean air, clean water, decent housing and an adequate diet, it is a clear and uncontested fact that personal habits of life influence the quality of an individual's well-being (Smurl, 1980). Kristen and his associates write that "It can be said unequivocally that a significant reduction in sedentary living and over-nutrition, alcoholism, hypertension, and excessive cigarette smoking would save more lives in the age range of 40-64 years than the best current medical practice" (1977, p. 461). One study related seven health practices concerning cigarette smoking, consumption of alcohol, sleeping habits, physical activity, and nutrition to physical health status. It was found that persons aged 76 years who observed all of the desired health practices enjoyed a health status equivalent to those aged 35 to 45 years but who practice less than three of the seven behaviors (Belloc and Breslow, 1972). In a study of 400 women, Pratt (1971) found that when the quality of health habits was good, the level of the subjects' health was equally good across all socioeconomic levels. However, lower socioeconomic status subjects with health habits of "medium" or "low" quality had a lower level of health than did higher socioeconomic subjects with "medium" or "low" quality health practices. Pratt concluded that a positive relationship between the quality of health practices and level of health could be demonstrated.

Physical exercise was chosen as the preventive health behavior to be examined in this study because it is unequivocally associated with health status (de Vries, 1980; Halfman and Hojnacki, 1981; Makower, 1982) and because there is wide variability in the extent to which it is practiced. Estimates of the percentage of American adults who engage in some form of physical exercise range from 59 percent (Harris, 1979) to approximately 33.5 percent (Harris, 1978; Yankelovich, Skelly and White, 1978). Demographically, those persons who are very active (spending more than 306 minutes per week exercising) tend to be males residing in the midwest and west, under age 35 years, and of a high socioeconomic status. Moderately active persons (204-306 minutes per week) also tend to be male, aged less than 50 years, and living in the east, while non-active persons are apt to be female, more than 50 years old, of lower socioeconomic status, and living in the east or south (Harris, 1979).

In a survey of the health beliefs and health practices of 60 adults, it was found that approximately 90 percent rated regular physical exercise as "important" or "very important" to their health, but that only 20 percent actually engaged in such exercise (Schmelling, 1980a). These findings indicate that the failure of many individuals to exercise regularly is not due to ignorance of the benefits of exercise but to other factors. In contrast with some traditionally studied preventive health behaviors such as obtaining immunizations or medical check-ups, exercise requires daily repetition and some modification of lifestyle. This requirement, which also characterizes other important health behaviors such as calorie limitation, may make exercise less likely to be carried

out. However, it is such lifestyle alterations which must be effected if the health status of the individual is to be improved. It is worthwhile to study variables associated with the performance of regular physical exercise. If such variables can be delineated, it may be possible to manipulate them and encourage physical activity among more persons.

This study focuses on the variables associated with the practice of a single health-related behavior. This limited focus is recommended by several authors. In a study of the stability of health behavior over time, Mechanic (1979) noted that each health behavior appears to have unique determinants and social reinforcers. He recommended that targeted problems such as smoking, physical inactivity, or poor diet be attacked. Following an investigation of health beliefs and preventive health behavior in working adults, Martin (1980) wrote that further research should focus on one behavior at a time in order to delineate the variables affecting each behavior.

### Conceptual Framework

Attempts to understand why people engage in preventive health behaviors have been only partially successful. Often nurses and health care providers have assumed that educating the patient or client about the risks associated with a health-damaging lifestyle or of the benefits of health-promoting behaviors would result in a behavioral change in the desired direction. While education has been generally shown to be effective in increasing knowledge levels (Fretwell, 1977), the relationship between education and behavior change is much more tenuous. Changes in

knowledge and/or attitudes may or may not be followed by changes in behavior (Iverson, 1977). Green writes that "common sense" suggests and health data confirm positive associations between attitudes, beliefs, and behavior," (p 25, 1970a). While some investigations do reveal strong associations between attitudes and behavior, and while such associations are intuitively appealing, it has also been shown that attitudes frequently are inconsistent with behavior (Heberlein and Black, 1976). Moreover, changes in attitudes frequently do not lead to corresponding changes in behavior (Green, 1970b).

#### Value-Expectancy Theory

The inconsistent relationship between attitudes and behavior has been addressed by a number of theorists. Several approaches to the problem may be classified as value-expectancy models. Value-expectancy theory describes behavior, or decision-making, under uncertainty. According to this model, attitudes toward an object or behavior are determined by beliefs about the object or behavior and by the evaluations associated with these beliefs. Beliefs refer to a person's subjective probability judgements of a relation between the object of the belief and some other object, value, concept, or attribute (Fishbein and Ajzen, 1975). The likelihood of performing a behavior is predicted from attitudes which can be estimated by multiplying an individual's evaluation of each attribute associated with the attitude-object by his subjective probability or estimate that the object has that attribute and summing the products for the total set of beliefs (Bettman, Capon, Lutz, 1975).

Thus, behavior is posited to be a function of three components: (1) the potential consequences or outcomes of behavior, (2) the expectation that a behavior will lead to the achievement or avoidance of these outcomes, and (3) an evaluation of these outcomes by the individual (Ryan and Bonfield, 1975a).

This conceptualization of attitude and of the relationship between attitudes and behavior characterizes value-expectancy models (Becker, Drachman, Kirscht, 1972). Feather (1959) reviewed five approaches relating to the analysis of behavior in choice situations where a decision is made between alternatives having different subjective probabilities of attainment. He noted that these approaches are similar in identifying the concepts of subjective probability, expectancy, and reinforcement value. Examples of value expectancy models include Rotter's social learning theory (1954), Atkinson's work on the motivational determinants of risk-taking behavior (1957), and Edwards (1961) development of the subjectively expected utility maximization model (SEU model). Early utility models developed by Bentham and Mill had their roots in the hedonistic philosophy of Ancient Greece. They held that the goal of human action is to seek pleasure and avoid pain (Edwards, 1954). Consistent with their origins, the early subjective expected utility theories were deterministic. They proposed that the individual would perform that behavior for which he anticipated the largest reward or least punishment. Later versions of subjective expected utility theories are stochastic, predicting only that the individual has a greater probability of choosing that action which will result in the greatest expected utility (Edwards,

1961). All SEU models assert that people maximize the product of utility or subjective value and subjective probability. In other words, the decision-maker chooses or is most likely to choose the course of action, from those open to him, for which the sum of the probability-value products is the largest (Ajzen, Fishbein, 1969; Tversky and Kahneman, 1981).

Edwards developed the SEU model in relation to commodity values and consumer behavior. However, the applicability of the model to health behavior has not gone unrecognized. In a study of adult smokers, Mausner (1971) found that those who modified their smoking behavior were distinguished from those who did not by virtue of a significantly higher subjective expected utility for not smoking. Subjects were asked to indicate the value placed on a variety of outcomes of smoking or not smoking and then to give an estimate of their expectations that these outcomes would occur if they continued to smoke or if they stopped. The data suggested that people decide to stop smoking because they have increased expectations of the benefits from cessation, not because of a heightened fear of the hazards of continuing. In another investigation of cigarette smoking, Kaplan and Cowles (1978) found support for the hypothesis that situation-specific measures of expectancies and values were useful in predicting smoking cessation.

#### The Behavioral Intent Model

An expected subjective utility formulation with potential application to the study of health-related behavior is the behavioral intent model. The model developed by Fishbein (1967) as an adaptation of

Dulaney's theory of propositional control provides the conceptual framework for this study. The behavioral intent model assumes that most behaviors of interest (including preventive health behaviors) are under voluntary control and that, in a given situation, a person forms or holds a specific intention to perform or not to perform a certain behavior. Behavioral intent is held to be the best single predictor of a single-act behavioral criterion (Fishbein, 1973). It is proposed that if a person intends to perform a behavior he probably will do so, and that the simplest and most accurate way to predict volitional behavior is to ask the person whether or not he or she will perform it. While determination of behavioral intent in this manner may serve to predict behavior, it does not explain it. Explanation of the determinants of behavioral intent are provided by the model. The model posits that behavioral intent, the outcome variable, is dependent upon the following components: attitude toward the specific behavior in question, and conceptions as to what other persons significant to the individual think he or she should do apropos of the behavior. The model may be expressed in algebraic form:

$$B \sim BI = (A \text{ act}) w_1 + (SN) w_2 \text{ where:}$$

B = behavior

BI = the behavioral intention to perform a  
specific behavior

A act = attitude toward performing the action  
or behavior

SN = subjective norms, or perceptions of the desires of significant others regarding the action

$w_1, w_2$  = weights reflecting the importance of each component.

The attitudinal predictor variable, A act, is a function of two subcomponents: the perceived consequences of performing the behavior and the evaluation of these consequences. The normative predictor variable, SN, is determined by perceptions of what persons important to the subject desire regarding the behavior and the motivation to comply with these persons. These relationships may be expressed as follows:

$$A \text{ act} = \sum b_i e_i$$

$$SN = \sum NB_j MC_j$$

where  $b_i$  = belief that performance of the behavior will lead to consequence "x"

$e_i$  = evaluation or value of "x"

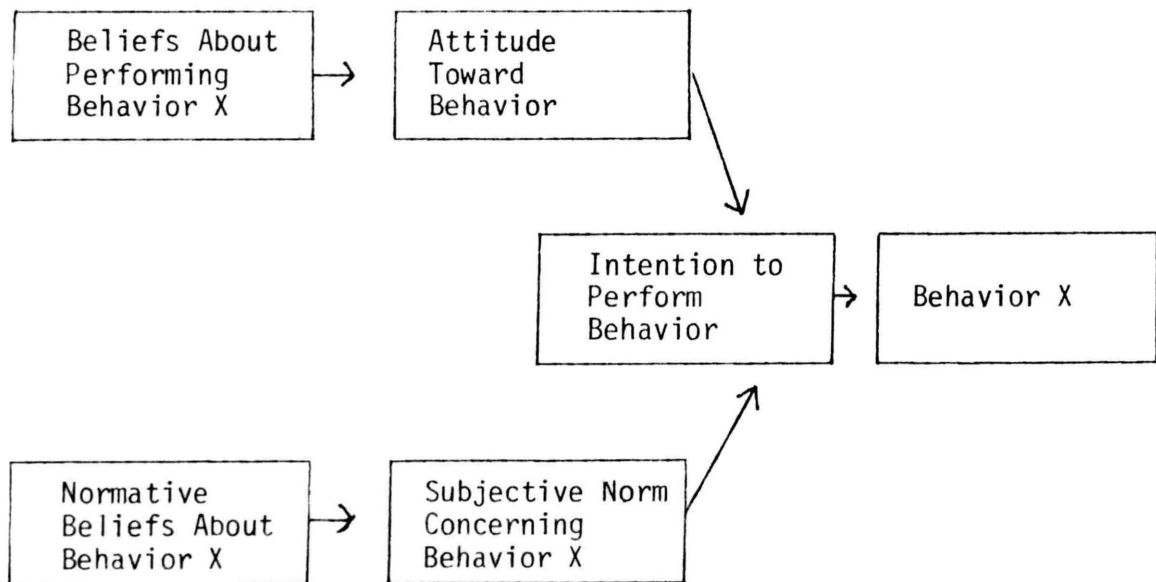
$NB_j$  = normative beliefs that a relevant other, j, thinks one should or should not perform the behavior

$MC_j$  = the motivation to comply with the relevant other, j.

The relative weights of the two components will vary from one behavior to another. By regarding the formula as a regression equation, standardized regression coefficients can be used as estimates of the

relative weights in a given situation (Ajzen and Fishbein, 1973) Given significant weights for A act and SN in predicting behavioral intentions, their subcomponents  $b_i$   $e_i$  and  $NB_j$   $MC_j$  can be extremely helpful in understanding the decision-making process. They can be used to pinpoint differences between those who intend to engage in a behavior and those who do not. They can also be useful in guiding effective attempts to influence behavior. In order to change behavioral intention, shifts can be attempted in the subcomponents of A act, SN, or both.

The components of the model may be represented schematically as shown below:



(Fishbein, 1976)

### Assumptions

The following assumptions were made:

1. Exercise, the behavior to be studied, is under volitional control.
2. In a given situation, an individual holds or forms specific intentions which influence subsequent overt behavior (Ajzen and Fishbein, 1973).
3. Behavioral intent is determined by attitude toward the act and subjective norms which are orthogonal and combine in an additive manner (Ryan and Bonfield, 1975b).
4. Attitudes and subjective norms determining the intent to exercise recreationally or as a part of one's work responsibilities, differ from those determining the intent to exercise for fitness.
5. Subjects will respond accurately when completing the questionnaire and reporting their exercise behavior.
6. The individual as a decisionmaker is rational in that he will prefer the alternative perceived as offering the highest utility (Tversky and Kahneman, 1981).

### Research Questions

This investigation of the attitudinal and normative factors associated with the intention to perform regular physical exercise is intended to answer the following research questions:

1. What are the modal salient beliefs with regard to exercising?
2. What persons or groups influence the decision to exercise?
3. How stable are attitudes and normative beliefs regarding exercise?
4. What are the relative contribution of the attitudinal and normative variables to the intent to exercise and to exercise behavior?
5. What is the relationship between intent to exercise and self-reported exercise behavior?
6. Can exercise intenders be distinguished from exercise non-intenders on the basis of their attitudes towards exercise?
7. What is the rate and distribution of exercise habits among the sample studied?
8. What, if any, demographic variables are associated with intent to exercise and/or the performance of exercise?
9. Is the claim of the behavioral intent model to

sufficiency supported or do other variables significantly increase its predictive power?

### Definition of Terms

Such terms as "belief" and "attitude" have been widely used and variously defined. In this investigation, the following conceptual definitions were used:

Beliefs about behavior "x": Probability judgements that link "x" to some attribute. The content of the belief is determined by "x", by the attribute, and by subjective probability that the relationship between "x" and the attribute is true.

Attitude: A function of beliefs about "x" and a bipolar evaluative judgement of "x" on either a dichotamous or continuous scale.

Intention: A probability judgement that links the individual to some behavior.

Behavior: Observable action quantifiable on either a dichotamous or continuous scale (Fishbein, 1976)

The measurement variables employed in this study were operationally defined as follows:

Exercise: Devoting at least 20 minutes a day, 4 days a week during the next month to running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics.

Intent to Exercise: (a) an estimation of the "chances in 10" that the respondent will engage in the specified physical activities during the month; (b) the mean of the subject's response to four Likert scales regarding the likelihood of engaging in the specified physical activities during the month.

Attitude Towards the Act (A act): The mean of the subject's response on nine evaluative semantic differential scales regarding participation in the specified physical activities.

Subjective Norms (SN): The mean of the subject's response to four Likert-type scales regarding the likelihood that significant others wish the subject to engage in the specified physical activities.

Beliefs About Consequences (Bi): An estimation of the "chances in 10" that exercising as specified will result in consequence "x".

Evaluation of Consequences (ei): The response to an evaluative semantic differential scale regarding consequence "x".

Normative Beliefs (NB): the "chances in 10" that a specified referent wishes the subject to engage in exercise.

Motivation to Comply (MC): An estimation, on a Likert-type scale, of the likelihood that the subject

wishes to conform with the desires of specified referents regarding exercise.

### Limitations

In this investigation, exercise is defined as regular, repeated participation in one or more of seven activities. These activities are ones commonly advocated as means to physical fitness (Halfman and Hojnacki, 1981; Pender, 1982). Exercise obtained through performance of such tasks as gardening or housekeeping is not included. Similarly, participation in sports of various kinds is not considered to meet the definition of "exercise" in this study. The reasons for excluding work and sports-related activities are twofold. First, it is very difficult to accurately measure the amount of activity obtained in such pursuits. Golfing with a golf-cart does not constitute aerobic exercise, and although a fast game of tennis may be strenuous, softball and baseball provide very little exercise to the heart and lungs. Similarly, "gardening" may mean vigorous hoeing or watering with a hose. Such variability would make the measurement of behavior almost meaningless. Second, it seems probable that work and sports-related activities are differently motivated and engaged in on a seasonal rather than regular basis. Thus, the consequences of such activities would differ from those of exercise as it is defined in this investigation. It is recognized that some persons do exercise in ways not defined in this investigation and this must be a limitation of the study.

The participants in the research were all faculty and staff members of two regional Oklahoma universities. The findings of the study may not be generalizable to other population groups.

### Summary

Lifestyle is closely related to health status. Chronic diseases, rather than infectious illnesses, are the most widespread and costly health problems in the United States today. Good health habits have been shown to prevent, delay the occurrence of, or ameliorate many of the common chronic diseases. Health practices related to cigarette smoking, consumption of alcohol, sleeping habits, physical activity, and nutrition have been demonstrated to be strongly associated with health status in adults. One of these health practices, regular physical exercise, is commonly known to be beneficial, yet there is wide variability in the extent to which it is practiced. One survey of 60 adults found that a large majority of the respondents acknowledged the importance of exercise to the maintenance of their health status. However, a much smaller number of subjects reported that they themselves exercised regularly. In common with many other health habits, the benefits of exercise can be realized only if it is carried out regularly over time. This required modification of lifestyle may make exercise less likely to be carried out. If those characteristics which distinguish exercisers from non-exercisers can be identified, it may be possible to design interventions to effectively increase the number of people who exercise regularly.

The behavioral intent model provides a framework to examine attitudes about exercise. This value-expectancy model assumes that most health-related behaviors are under conscious control and that a person forms or holds a specific intention to perform a certain behavior. Behavioral intent is held to be the best predictor of a single-act behavioral criterion. It is proposed that if a person intends to perform a behavior he probably will do so if the behavior is entirely under his control. The simplest and most accurate way to predict volitional behavior is to ask the person whether or not he will perform it. Explanation of behavioral intent is provided by the components of the model. The model posits that the behavioral intent is a function of two factors: (1) attitude towards the action or behavior, and (2) subjective norms. The attitudinal predictor variable,  $A_{act}$ , is a function of two sub-components: salient beliefs regarding the perceived consequences of performing a given behavior, and the evaluation of these consequences. The normative predictor variable,  $SN$ , is determined by the subject's perception of what those close to him desire regarding the behavior and the motivation to comply with these significant others. These variables may be operationalized by means of a questionnaire employing probability estimates and evaluative semantic differential scales. The relative contribution of the two variables to the determination of intent may vary among groups of subjects and from one behavior to another. Standardized regression coefficients

can be used as estimates of the relative weights of each factor in a given situation.

If the attitudinal and predictive variables are shown to contribute significantly to the prediction of intent, their sub-components can aid understanding of the decision-making process. The sub-components also can be used in the identification of differences between intenders and non-intenders. If changes in behavioral intent are desired, shifts can be attempted in the sub-components of beliefs, evaluation of these beliefs, perception of the wishes of others and/or the motivation to comply.

For the purposes of this study, the definition of exercise is limited to the regular, repeated performance of seven activities: running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics. Work and sports-related activities are excluded on the grounds that they are variable, difficult to operationally define, and may be differentially motivated. Respondents for the study were randomly selected from the faculty and staff of two regional Oklahoma universities.

## CHAPTER 2

### REVIEW OF LITERATURE

The discussion of literature pertinent to this investigation falls under three headings. In the first, the use of the Health Belief Model to explain health behavior is reviewed. The limitations of the applicability of this conceptual framework to preventive health behavior are explored. A discussion of the use of the behavioral intent model in the consumer, the social psychology, and health arenas follows. Finally, six pertinent issues in the operationalization of the behavioral intent model are explored. These issues are: (1) consistency between the attitude measure and the criterion behavior, (2) the claim of sufficiency of the model, (3) the use of self-report, (4) the identification of salient beliefs and the need for a measure of the relative importance of the consequences, (5) the scaling techniques utilized in the model, and (6) issues of reliability and validity.

#### Health Belief Model

The subjective expected utility formulation most commonly used to explain health behavior is the Health Belief Model. As originally formulated (by Drs. Hochbaum, Kegels, Leventhal, and Rosenstock), the model stated that persons would undertake health action to avoid disease if they held four basic beliefs:

1. That they were susceptible to the disease or condition.

2. That the occurrence of the disease or condition would have at least a moderately severe impact on some aspect of their lives.
3. That taking action reduces either their susceptibility to the illness, the severity of the illness, or both.
4. That taking such action would not be associated with significant barriers such as pain, cost, inconvenience, etc.

In addition to these beliefs, various cues to action were held necessary to trigger the behavior (Rosenstock, 1974b). The form of the relationship among the variables of the model was not specified, but in most research based on the model, linear additive assumptions have been used (Sennott, 1980). The model was later reformulated in value-expectancy terms (Maiman and Becker, 1974). In this form, prediction is made not of behavior but of "disposition to act." Disposition to act is determined by a multiplicative relationship between the variables of susceptibility, severity, and benefits minus barriers (Maiman and Becker, 1974). Although disposition to act has been specified as the dependent variable in this formulation of the health belief model, most research studies based on the model have attempted to predict or explain behavior itself (Becker, Drachman and Kirscht, 1977; Becker, Drachman and Kirscht, 1974; Becker and Maiman, 1975). "Intention to comply" was included as a motivational variable in a study of dietary compliance (Becker, Maiman, Kirscht, Haefner, Drachman, 1977). In this same study, the authors acknowledged the disease-avoidance orientation of the health belief model as constricting and expanded the formulation to include positive health motivations.

The designation of behavior as the outcome variable in the health belief model is not consistent with value-expectancy formulations, and the assumption that health behaviors are motivated by a desire to avoid disease raises questions about the applicability of the model to preventive health behaviors. Health consciousness or concern for health status may help to explain sick or illness behaviors. However, the concept may be less useful in explaining preventive behavior (Rosenstock and Kirscht, 1979). A number of authors have noted that health-related motives do not always give rise to health-related behavior and that health-related behavior may not always be determined by health-related motives (Becker and Maiman, 1975; McKinley, 1972; Steele and McBroom, 1972). Milo (1976) writes that most human beings will develop patterns of behavior or lifestyles which seem to cost them less and/or from which they gain more of what they value. If health is valued, it often is not valued for its own sake but because it helps people to be what they want to be and to achieve desired goals (Hochbaum, 1979; Pender, 1975). Conscious, non-coerced health behavior has been related to one or more of the following variables: (1) a wish to stop or control damage, (2) a wish to detect latent conditions or validate healthiness, (3) a wish to protect oneself from potential disease, (4) a wish to observe social convention, and (5) a desire to practice a personally meaningful activity (Ruffing, 1979). These last two motives are not directly related to health concerns. Hochbaum (1979) suggests that most people diet, exercise, etc., not to prevent disease but because it helps them look good and feel good.

Similarly, he speculates that people may cease smoking because it increases their sense of willpower. This suggestion is supported by a nationwide study which found that the reasons given by people for giving up smoking in the absence of compelling symptoms included: (1) health concerns, (2) a desire to set a good example for others, (3) a desire for self-control, and (4) aesthetic reasons (DHEW, 1979). Only one of these reasons is directly concerned with health. Sennott (1980) applied the health belief model in a study of the self-reported likelihood of practicing 10 health behaviors. She found that within her sample of 60 subjects, likelihood of adopting the health behaviors was mainly a function of the perceived difficulty associated with the behavior. A fairly low level of difficulty associated with the behavior was all that was required to substantially decrease the likelihood of the behavior being adopted. She found that the perceived effectiveness of the behaviors in reducing threat of illness had little relationship to the intention to adopt the behaviors. Sennott concluded that the perceived value of a behavior may not relate to its threat-reducing properties but to some other quality of the behavior in question.

#### Behavioral Intent Model

While the likelihood that various health-related behaviors are differently motivated has been recognized (Langlie, 1977; Mechanic, 1979; Steele and McBroom, 1972; Williams and Weschler, 1972), and the possibility that preventive health actions may be related to concerns other than health has been widely addressed, much of the research in the area

of health behavior continues to be predicated on the concept of disease-avoidance. There is a need for investigations of the factors associated with single health behaviors using a model which does not assume disease-avoidance to be a motivating variable. The behavioral intent model provides the conceptual framework for such an investigation. Ryan and Bonfield (1975) note that there are three reasons for interest in the behavioral intent model: (1) it provides a means to integrate attitudinal and normative influences relative to behavior, (2) it may be useful in explaining and predicting behavior, using behavioral intentions as a mediating variable, and (3) it has sound conceptual antecedents and empirical support.

Support for the normative variable of the behavioral intent model is found in a number of investigations. In a study of the response to a physical activity program on the part of 239 men, Heinzelmann and Bagley (1970) found that the subjects had differing motivations for initiating exercise programs and that social influences were very important. Kasl (1974) noted that those persons who are successful in smoking cessation have spouses and friends who do not smoke and saw this as an indication of the importance of social support. Schelzel (1977) found that participation in a program to reduce the risk of heart disease was related only to past preventive behaviors and to support from the subject's spouse and physician. He concluded that theoretical schemes which stress the influence of significant others on preventive health behaviors might better account for this type of behavior. Reviewing the literature on health behavior, Green (1970a) concluded that, in

the absence of immediate threat to physical well-being, preventive health actions are taken in response to social pressures and supports in the form of social norms. These social pressures and supports are posited as the main determinants of psychological readiness and preventive health behavior (1970b).

One component of the normative variable, the "motivation to comply," has proved to be the weakest link in the Fishbein formulation. It is sometimes omitted from research reports because it may reduce the predictive power of the model (Fishbein and Ajzen, 1972). Ryan and Bonfield (1975b) note that a number of marketing investigations based on the behavioral intent model have not used the motivation to comply variable. In their study of adolescent alcohol use, Schlegel, Crawford, and Sanborn (1977) did not include the motivation to comply variable because it lessened prediction of behavioral intent. A number of other studies based on the model have found that the motivation to comply variable did contribute to total explained variance. The question of whether or not the variable should be included is not yet resolved.

The behavioral intent model has as its outcome variable behavioral intention. To the extent that behavioral intention is correlated with behavior, the model will explain and predict behavior. The relationship between behavioral intention and behavior is assumed to be a function of the following factors:

1. The time interval between the measure of intention and observation of the behavior. The greater the lapse of time between the two, the more likely it is that

intervening events or new information will act to change the behavioral interest and reduce its correlation with behavior.

2. The extent to which the behavior is under the control of the individual. Those behaviors whose enactment depends upon factors which the individual cannot entirely control are likely to have a lower correlation with behavior (Jaccard, 1975).
3. The extent to which the individual has had prior experience with the criterion behavior. If a person has had prior experience with the behavior, it seems reasonable to assume that his attitude toward the act and perception of normative expectations regarding the act will be more stable over time and will be more consistent with behavioral intent and subsequent behavior (Songer-Nocks, 1976).
4. The congruence in degree of specificity between the measure of behavioral intent and of behavior (Fishbein and Ajzen, 1975; Suchman and Johnson, 1976).

Because behavioral intent rather than behavior is the outcome variable of the model, not all investigations based on the model report actual behaviors. For those that do, the relationship between the two factors is variable. Fishbein and Ajzen (1975) report correlations ranging from .7 to .9 for a variety of studies.

A large number of studies in which the behavioral intent model has been applied to consumer brand preference provide empirical support for the model in this area. In a review of 14 studies of consumer behavior based on the model, the average correlation between behavioral intent and attitudinal and normative beliefs was .60. The model was shown to have value in predicting and explaining variance in purchase intentions and purchase behaviors (Ryan and Bonfield, 1975b). When the model was applied to physician prescribing behavior, the correlation between the behavioral intent to prescribe a certain oral hypoglycemic agent and actual prescribing behavior was only .4. This relatively low correlation may have been due to situational factors and a prolonged interval between the measure of intent and that of behavior. However, the correlations of behavioral intent and evaluative beliefs ranged from .43 to .60 (Harrell and Bennett, 1974). Bass and Talarzyk (1972) applied the model to a comparison of individual's preference ordering of brands. Five attributes were specified for each of six product categories and subjects were asked to rate each attribute. The researchers concluded that the model has considerable potential as a basis for studies of consumer choice behavior.

There is evidence that the behavioral intent model is applicable to many situations in which the prediction and explanation of volitional behavior is desired. An investigation of beliefs, attitudes, intention, and voting behavior in a gubernatorial primary found that the model predicted intent well. The correspondence between belief and attitude was to some degree affected by the income and educational level of the

respondents, their degree of familiarity with the candidate, and their degree of commitment to the candidate (Davis and Runge, 1981). An investigation of the applicability of the model to voting behavior in a referendum on nuclear power plants resulted in a correlation of .89 between voting intention and subsequent self-reported voting behavior (Bowman and Fishbein, 1978).

✓ The behavioral intent model has been applied to fertility behavior or contraceptive use, and has been shown to have value in predicting behavioral intention (Jaccard and Davidson, 1975; McCarty, 1981) and behavior (Kathandapani, 1971). In a study of 136 women awaiting the results of a pregnancy test, the intention to continue the pregnancy or obtain an abortion, if the test proved to be positive, was highly correlated (.96) with subsequent behavior (Smetana and Adler, 1980).

✓ An investigation of attitudes toward organ transplants revealed that normative beliefs were the most important determinants of behavioral intent and that the model was able to account for more than 50 percent of the variance in intent (Schwartz and Tessler, 1972). The determinants of another altruistic behavior, giving blood, were investigated by Pomazal and Jaccard (1976). They found a correlation of .59 between intention to give blood and the behavior. The authors noted that the correlation between intention and behavior might have been higher if some of the subjects had not been dependent on transportation to the blood donating area.

Although the model has been applied in a variety of field settings including consumer behavior, (Schlegel, Crawford, and Sanborn, 1977)

the model has been used to a very limited extent in the area of health behavior to date. A study of the influence of personal attitude and the expectations of others on preventive health behaviors, utilizing the behavioral intent model as a conceptual framework, was recently conducted by a nurse-researcher. The relative contribution of personal attitudes and normative influences to the practice of five health behaviors was studied. The behaviors included exercising daily, limiting calories, avoiding stress, openness with others, and planning for major life changes. Preliminary results revealed that in the behavior of exercising daily, both personal attitudes and the expectations of others were important in determining whether an individual practiced the behavior (Pender, 1979). In a study of adolescent alcohol use, the model yielded a mean correlation of .753 between intention to drink and the normative and attitudinal components of the model. The mean correlation between behavioral intent and self-reported alcohol use one month later was .469 (Schlegel, Crawford, Sanborn, 1977). An investigation of attendance at a chronic disease screening clinic of senior citizens in a rural area of Oklahoma showed a correlation of .806 between stated intention to attend the clinic and actual attendance 10 days later (Schmelling, 1980b). Saltzer (1979) found a modest (.44) but significant correlation between intent to lose weight and weight loss 6 weeks later. In this prospective study of women attending weight-loss clinics, both attitude towards the act (weight loss) and perceived social norms were significantly related to intent to lose weight. Normative beliefs constituted a stronger predictor than perceived consequences both for behavioral

intent and actual weight loss behavior (Saltzer, 1979). Finally, Oliver and Berger (1979) studied the applicability of both the behavioral intent model and the health belief model to immunization behavior in a sample of 722 subjects. The data "strongly suggested" that the best predictor of inoculation behavior was intention to engage in that behavior, thus supporting a proposition of the behavioral intent model. When intention was viewed as the criterion of interest, the behavioral intent model explained at least 50 percent more variance than did the health belief model.

### Issues in the Operationalization of the Model

#### Consistency in Measures

The importance of consistency in the degree of specificity between the measures of predictor and criterion variables in the behavioral intent model has been emphasized (Fishbein, 1967). The most generally accepted means of increasing the consistency between attitude and behavior is to increase specificity of the measures (Suchman and Johnson, 1976). Fishbein and Ajzen (1975) have pointed out that there may be little correlation between a general measure of intention and a specific measure of behavior. For example, there may be a low relationship between one's intentions with regard to a group of people and one's behavior towards one member of the groups (Weigel, Vernon, Tognacci, 1974). Reviewing literature on attitude-behavior consistency, Liska (1974a) concludes that the concept of attitude-behavior relevance is of critical importance and that the impact of attitude on behavior is greatest when:

(1) the object of the attitude is the behavior itself and not the object toward which the behavior is addressed, and (2) the attitude and behavior are measured at an equivalent level of generality. Heberlein and Black (1976) used eight attitude measures at four degrees of specificity in a study of attitudes toward the purchase of unleaded gasoline. They concluded that attitude measures are better predictors of behavior when the measure and the behavior are at equivalent levels of specificity.

#### Sufficiency of the Model

There is a potentially infinite number of variables which might be studied in relation to their effect on behavioral intent: personality, prior experiences, demographic factors, opportunities, interests, etc. The developers of the model claim that all social, psychological, and demographic variables which may influence behavioral intent are mediated through the model (Bowman and Fishbein, 1978; Fishbein, 1967). The model's claim of sufficiency proposes that all such variables can only be related to behavioral intention to the extent that their influence is exerted through a component A act and/or SN having a significant weight in the prediction of intentions or if the variable affects the relative weights of the two components (Ajzen and Fishbein, 1973). This claim of sufficiency has been tested several times with varying results. In their study of the attitude and intentions of 195 subjects toward organ transplants, Schwartz and Tessler (1976) found that the influence of a personal sense of moral obligation was not entirely mediated through the model's variables, thus casting doubt on the validity of the sufficiency

claim. Investigating possible limitations of the model, Songer-Nocks (1976) found that degree of prior experience with the behavior and motivational set were not entirely mediated by the model's variables. She concluded that the model may serve best under conditions of familiarity with the behavior and in the absence of high motivational pressures. In response to these conclusions, Fishbein (1976) pointed out that Songer-Nocks had used behavior rather than behavioral intent as the outcome variable. When behavioral intent was made the outcome variable, the data do appear to support the claim of sufficiency.

In their study of adolescent alcohol use, Schlegel, Crawford, and Sanborn (1977) specifically investigated the sufficiency of the behavioral intent model. They found that the inclusion of 33 additional variables theoretically related to adolescent drinking behavior resulted in only a 7 percent increase in explained variance and concluded that the sufficiency of the two components of the behavioral intent model was generally supported. The previously reported study of beliefs and attitudes in a gubernatorial primary (Davis and Runge, 1981) found that the correspondence between belief and attitude was somewhat affected by three factors extraneous to the model. Finally, Bowman and Fishbein (1978) specifically tested the claim to sufficiency of the model and found that it was largely supported. In view of the conflicting evidence on this point, the sufficiency claim was tested in this study.

#### Use of Self-Report as a Behavioral Measure

The use of retrospective self-report as a measure of behavior has been criticized on the grounds that the desire to please the investigator

or give socially desirable responses may be a source of error (Weigel and Newman, 1966). However, Liska (1974) reports on a growing body of studies from a variety of research areas which show that self-report of behavior is very often a valid measure of overt behavior. He cites several investigations in which the correlation between self-reported behavior and independent measures of the same behavior were correlated at .8 or better. A recent report on the accuracy of information on smoking habits provided on a self-administered questionnaire by 267 persons revealed a high correlation between the self-report and blood levels of serum thiocyanate and carbon dioxide. The investigators concluded self-administered questionnaires are an accurate source of information (Petitti, Friedman, Kahn, 1981). Many of the investigations of health related behaviors have utilized self-report as a measure of the criterion variable (Fishbein and Ajzen, 1975). Because there is evidence that self-report can provide an accurate estimate of behavior, and because a number of behaviors of interest to researchers can only be measured in this way without intolerable and indefensible invasions of privacy or the use of deception, the use of self-report seems justified as a measure of overt behavior.

#### Salient Beliefs and Measures of Importance

Questions concerning the related concepts of salient and important beliefs in the behavioral intent model have generated controversy (Pessemier and Wilkie, 1974). Fishbein writes that while an individual may have many beliefs about an object or behavior, only those beliefs

which are salient are determinants of attitude. The greater the number of salient beliefs contained in an instrument designed to measure attitude, the more valid the instrument will be (1976). There is no independent, validating method of assessing salience. However, it is assumed that saliency refers to the notion that an individual is conscious of an outcome. Therefore, salient outcomes have a high probability of being elicited in a free association situation (Ryan and Bonfield, 1975a). Studies on attention span or apprehension suggest that an individual can perceive and attend to approximately 6 to 11 objects at a time. Therefore, it seems likely that only 5 or 6 to 11 beliefs regarding a behavior are salient and function as attitude determinants. Because these beliefs are conscious, it is assumed that they will be the ones first mentioned when the individual is asked to name the consequences of a behavior. The 6 to 11 beliefs occurring with greatest frequency are taken to be the modal salient beliefs in a population (Fishbein and Ajzen, 1975). The elicitation technique most frequently used to determine salient beliefs is to interview an independent sample drawn from the same population as the sample to be studied and ask them to:

- (1) list the consequences of the target behavior, and (2) identify those individuals or groups who serve as referents with regard to the behavior (Jaccard, 1975). Ryan and Etzel (1975) advocate the use of this elicitation technique to identify salient beliefs and referents but point out that elicitation procedure may not generate outcomes generalizable across groups. The relative importance of the outcomes, aside from the

information derived from the belief and evaluation statements is also of interest (Ryan and Etzel, 1975).

Although the number of salient beliefs regarding an action may range from 6 to 11, it is often impossible to identify only those outcomes and exclude all others. Most studies of the behavioral intent model list more than 11 beliefs. Fishbein and Ajzen (1975) note that attitude can be measured by considering a person's response to a set of belief statements even when they involve nonsalient beliefs.

The behavioral intent model does not include a term for the importance of beliefs. However, it has been argued that some beliefs are more important than others in determining attitude (Hughes, 1974; McDonald, 1971; Sheth and Talarzyk, 1972). Fishbein (1975) writes that those outcomes most frequently mentioned in the elicitation are most salient and are most likely to be determiners of attitude. Additionally, those attributes or outcomes that are important are likely to be evaluated more positively or negatively than are unimportant outcomes. Evaluation of important outcomes may be more polarized because people tend to have more information about things that are important to them (Fishbein, 1975). However, this measure of importance cannot be used to determine whether a belief is salient or not (Fishbein and Ajzen, 1975). Hughes (1974) argues that multiple regression analyses, using behavior or behavioral intent as the dependent variable, is a means for measuring attribute or outcome importance. Fishbein and Ajzen (1975) disagree. They submit that correlation provides no evidence of causality and that it is inappropriate to assume that a high correlation

indicates an important determinant of attitude. These researchers claim that there is "no evidence that such correlations can be used to identify salient and nonsalient beliefs" (1975, p 222). On theoretical grounds, Fishbein (1971) also advises against the use of factor analyses to identify "important" attributes, outcomes or dimensions.

A number of researchers involved in studies of consumer behavior have noted the need to establish the differential motivating importance of various product attributes (Frost, 1971; Green, and Wind, 1973; McDonald, 1971; Mainpour and Wiley, 1972). Empirical tests of behavioral intent models with and without importance weights have shown conflicting results. Four studies showed a suppression effect on the relationship between beliefs and intent when importance weights were added. Six studies showed little or no difference, and five revealed that a measure of importance increased the predictive value of the model (Pessemier and Wilkie, 1974).

One approach open to researchers using the behavioral intent model and concerned about the issue of importance, has been put forth by Cohen (1974). He notes that when one can assume a common direction of preference in a value-expectancy model (cavity prevention in toothpaste, for example) it then is appropriate to measure the importance of this attribute or outcome. When value and importance are highly correlated, as they are in cases of common direction of preference, the researcher may ask the subject to estimate the importance of the outcome.

### Scaling Techniques

The scaling techniques most commonly employed to measure the attitudinal and normative constructs of the model are the Likert scale (Likert, 1974) and the semantic differential (Osgood, Suci, and Tannenbaum, 1957). Rokeach (1973) has noted that it is possible to measure values with the semantic differential technique. In a study of 88 subjects, Homant (1969) found value preference as measured by Rokeach's value scale and the evaluative scales of the semantic differential to measure attitudes toward snakes. They found a strong correlation between the attitudes measured and overt behavior.

The most common form of the Likert and semantic differential scales has been a seven-point, bi-polar scale. A number of studies do not report the actual scale values used in scoring. In those studies where the scoring methods can be ascertained, two approaches have been used. Scale items have either been scored from 1 to 7, or from -3 to +3. Fishbein and Ajzen (1975) have recommended use of the bipolar scales. Ryan and Bonfield (1975) agree, and show that use of unipolar scoring methods can lead to results which are inconsistent with the expectations of value expectancy theory.

The technique of probability estimation has not been used in connection with the behavioral intent model, but appears to have potential value in this area. In an investigation of consumer buying behavior, Juster (1966) found that an estimate of purchase probabilities yielded a higher correlation with purchasing behavior than did a measure of intentions. Juster points out that a question in the numerical form,

"What are the chances . . . ?" provides more useful information than do scales which depend on the idiosyncratic interpretation of adjectives. Such adjectival scales may be interpreted differently by different persons, and by the same person from time to time. Juster utilized flash cards with a probability scale ranging from 10 to 0, and containing both quantitative and qualitative descriptions of scale points. He later indicated that quantitative descriptions alone were perhaps less subject to errors in interpretation. Participants in the study were first given some practice on the scale, using questions for which the substantive content was of less interest. Suchman and Johnson (1976) have commented that Juster's arguments are persuasive and that there would be value in experimenting with probabilistic formats in spheres other than consumer purchasing behaviors. Preventive health behaviors are such a sphere, and the technique of probability estimation was utilized in this investigation.

#### Issues of Reliability and Validity

Most of the investigations of health behavior reported in the literature do not address the question of the reliability and validity of the measuring instruments. Fishbein and Ajzen (1975, p. 108) write that there is "abundant evidence that attitude scales are highly reliable under test-retest situations." A test-retest estimate of reliability for an instrument measuring intentions, beliefs, and the evaluation of beliefs faces the problem that the variables may change over time. Nevertheless, a test-retest seems to be the only

appropriate means of establishing reliability for an instrument of this sort (DuBois, 1965; Guilford and Fruchter, 1973). A test-retest reliability coefficient helps to establish the stability over time of attitudes and normative beliefs concerning exercise, and the reliability of the instrument.

Content validity of an instrument is assured by building into the instrument appropriate items reflective of the domain under consideration (Anastasi, 1969). Convergent validity of items in the behavioral intent model has been assessed by obtaining different measures of attitude toward the same object, and different measures of intentions with regard to the performance of a behavior. For example, Ajzen obtained probability estimates of belief statements and compared these estimates with responses on four probability scales. The sum over the four scales was taken as one measure and the quantitative estimate as a second. The two measures were highly correlated and yielded similar results (Fishbein and Ajzen, 1975).

### Summary

Most investigations of health-related behavior have used the Health Belief Model as a conceptual framework. The applicability of this formulation to prevent health behavior is limited by its assumption that health-related behaviors are motivated by a desire to avoid disease. There is evidence that health-related motives do not always lead to health-related behavior and that health-related behavior may not be determined by motives related to health.

The behavioral intent model provides a framework for the investigation of health-related behaviors. It does not assume that disease avoidance is a motivating factor in health behavior. The behavioral intent model has been utilized in a variety of field settings including investigations of voting behavior, contraceptive usage, altruistic actions, and consumer behavior. The model has been shown to have predictive and explanatory power in these settings. There is considerable empirical support for the constructs of the model, although "motivation to comply" may not increase its predictive power. The use of the model in investigation of health behavior is limited. Those studies which have been carried out show evidence of the applicability of the model in this area.

Six issues in the operationalization of the model have been identified. These include: (1) consistency in the specificity of measures of attitude and intent; (2) the claim of the model to sufficiency, (3) the use of self-report as a measure of behavior, (4) the identification of salient beliefs and measures of the "importance" of attributes of outcomes, (5) scaling techniques utilized in the model; and (6) means of obtaining estimates of the reliability and validity of instruments which operationalize the model's constructs. Each of these issues is discussed in some detail.

## CHAPTER 3

### PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

This investigation utilized a descriptive, correlation approach (Polit and Hungler, 1978). A cross-sectional design was employed; data on the predictor and criterion variables were collected over the period of two months. The predictor variables included: (1) salient beliefs regarding the consequences of exercise, (2) evaluation of each of these beliefs, (3) normative beliefs concerning the wishes of others with regard to exercise, (4) motivation to comply with these wishes, (5) a summary statement of attitude toward the act, and (6) a summary statement of subjective norms. The criterion variables were a measure of behavioral intent to exercise or not to exercise and a measure of self-reported exercise behavior. A survey technique was used to gather data on all these variables except self-reported exercise behavior through a self-administered questionnaire. Exercise behavior was ascertained by means of a telephone call to each respondent one month after the return of the questionnaire.

#### Setting

The setting for the investigation was two regional universities in south-central and south-western Oklahoma. The area is largely rural. Both regional universities are located in towns with populations

approaching 20,000 persons. These towns are the largest in their areas and both are centers for education, health care, and shopping. One of the towns calls itself "Southern Oklahoma's Downtown" and this claim is valid. Because both towns are the hub of activity for relatively large areas, they offer more facilities, services, and amenities than might otherwise be found.

### Population

The population from which the sample was drawn consisted of the faculty and the staff of two of the six regional Oklahoma universities. One university was chosen for convenience, because the investigator is employed there. The other was chosen at random from the remaining five regional universities. The two universities are approximately 150 miles apart and are similar in many ways. Both are primarily undergraduate institutions, offering masters degrees in a few areas but no doctorates. The enrollment of one is approximately 4,000 students while that of the second is approximately 5,000 students.

Once the two universities had been selected, lists of all full-time faculty and staff employed by the respective institutions were obtained. A number was assigned to each name. One institution listed 327 faculty and staff, and the other listed 378 faculty and staff. From these lists, computer-generated random numbers were used to select 120 names from each institution. The first 20 names from each institution were designated the "initial interview sample" while the remaining 200 persons became the sample to whom the final questionnaire was sent. The sample

was limited to those aged 30-55 years. This age group provided variability in terms of age while reducing the likelihood that health problems associated with advancing years would limit exercise practices. Persons under 30 years of age were excluded because their perceptions and practice of exercise may be quite different from those aged 30 or more. It was not possible to ascertain the age of the subjects at the time the sample was drawn. However, most faculty and staff at both institutions are between 30 and 55 years of age, the mean age being approximately 42 or 43 years. All persons in the "initial interview sample" were between 30 and 55 years old. Seventeen (10.6%) of the 160 respondents in the final sample were either less than 30 years (6) or more than 55 years (11). These questionnaires were discarded.

Following the selection of the initial interview sample and the subjects to receive the final form of the questionnaire, 31 additional names were randomly drawn from faculty and staff of one of the institutions. These 31 persons completed the first draft of the questionnaire on two occasions spaced four weeks apart, furnishing test-retest data for the questionnaire.

#### Protection of Human Subjects

All persons asked to participate in the investigation were competent adults of mature years. The initial interview subjects were contacted by telephone. The purpose of the study was explained and the respondents were asked if they would answer a few questions about their perception of the advantages and disadvantages of exercise. They

were also asked to list any person or persons who might serve as referents with regard to exercise. Finally, the respondent was asked to provide some demographic data about himself/herself (see Appendix D). No identifying information appears in the study. No one refused to participate in this phase of the study.

The initial draft and final forms of the questionnaire were accompanied by a cover letter in which the purpose of the study was described (see Appendix F). Subjects taking the initial form were advised that they would be asked to again complete a questionnaire four weeks later. Subjects to whom the final form of the questionnaire was sent were told that they would be contacted by telephone sometime later. Both groups of subjects were told that the questionnaires had been numbered to permit identification but that confidentiality would be preserved. Both groups were informed that participation in the study was voluntary and that they could withdraw at any time. Prior to the selection of the sample, the researcher met with the academic vice presidents and deans of the two institutions to obtain permission to approach the faculty and staff (see Appendix I). It was decided not to ask these university administrators to urge their staff to participate in the study. In this way, any hint of coercion was avoided. Both groups of subjects were advised that their return of the questionnaire constituted their informed consent to participate in the study.

## Instrument

### Development of the Instrument

The development of the final questionnaire "Attitudes Towards Exercise" moved through an orderly sequence of steps over a six-month period. These steps are described in this section.

1. A randomly-selected sample of 20 faculty and staff from each institution (40 persons) was contacted by telephone. These persons were asked to identify the positive and negative consequences of the practice of physical exercise as it was defined in the study. Next, the interviewees were asked to identify persons or groups who would serve as referents for the practice of such exercise. This is the elicitation technique recommended to operationalize the variables of the model. Demographic data on the interviewees were collected.
2. Criteria for the selection of consequences and referents were established (see Appendix C ). The 16 consequences and four referents meeting these criteria were included in the first draft of the questionnaire.
3. The questionnaire was constructed, operationalizing the predictor variables and the criterion variable. The four sub-component predictor variables were quantified as described below:

- a. Salient beliefs regarding the consequences of exercise: Using the technique of probability estimation, respondents were asked to estimate on a scale of zero to ten the probability that a given consequence would follow exercise. For purposes of scoring, these estimates were linearly transformed as -5 (zero probability) to +5 (10 chances in 10).
- b. Evaluation of these beliefs: Below each estimate of the probability of a consequence, the respondent was asked to evaluate the consequence on a seven-point "good-bad" scale. The responses were converted to -3 (bad) to +3 (good) scale for scoring. The placement of the consequences and their evaluations was randomized, as was the direction of the "good-bad" scales.
- c. Normative beliefs concerning the wishes of others with regard to exercise: Respondents were asked to estimate the probability that each of the four referents identified by the elicitation procedure would wish the respondent to exercise. These probability estimates were scored from -5 to +5.

- d. Motivation to comply with these wishes: The "motivation to comply variable" was operationalized by asking, on a seven-point "likely-unlikely" scale, the extent to which the respondent wished to do what the referent desired regarding exercise. These responses were scored on a -3 (unlikely) to +3 (likely) scale. Placement of these normative beliefs and motivation to comply items was randomized.

The primary components of the behavioral intent model are the predictor variables of attitude toward the act and subjective norms, and the criterion variable behavioral intent:  $BI = (A \text{ act})_{w_1} + (SN)_{w_2}$ . To obtain an estimate of the convergent validity of these items, Fishbein and Ajzen (1975) recommend the use of two measures employing different scales. This procedure was followed in the construction of the questionnaire. Two measures of attitude toward the act, of subjective norms, and of behavioral intent were obtained. These measures are discussed below:

1. Summary Statement of Attitude: In order to capture a summary of the attitude toward exercise, each respondent was asked to rate the following statement on nine evaluative semantic differential scales, "Devoting at least twenty minutes a day, four times during the week to running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics for the next month." The

evaluative scales included "good-bad," "valuable-worthless," "difficulty-easy," boring-interesting," "convenient-not convenient," "enjoyable-not enjoyable," "impossible-possible," "not worth it-worth it," "unnecessary-necessary." Scale order and directionality were randomized. These bipolar evaluative adjectives were selected on the basis of applicability to the concept of exercise (Mackie, 1975; Sennott, 1980; Wahlquist, 1977). Each of these seven-point scales was scored from -3 to +3, with "+3" corresponding to a very favorable evaluation. Attitude was measured by the average evaluation of the nine scales (Bowman and Fishbein, 1978; Ryan and Bonfield, 1975b). The second measure of attitude toward the act consisted of an estimate of the "chances in 10" that the respondent had a generally favorable attitude toward exercise as defined in the questionnaire.

2. Summary Statement of Subjective Norms: In accordance with the recommendation of Fishbein and Ajzen (1975) subjects were asked to respond to the following statement, "Most people who are important to me think I should engage in running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics for at

least twenty minutes a day, four times a week during the next month." A seven-point "likely-unlikely," "true-false," "agree-disagree," "probable-improbable" scale was employed. The average of the four scale responses, scored from -3 to +3, was used as the normative belief score. The second measure of subjective norms was an estimate of "the chances in 10" that most people important to the subject believed that he/she should exercise.

3. Behavioral Intent: Respondents were asked to estimate the "chances in 10" that they would "spend at least 20 minutes a day, four days a week in running, swimming, cycling, jumping rope, brisk walking, jogging, or doing calisthenics during the next month." The second measure of intent was a four-item, seven-point probability scale. The scale consisted of "likely . . . unlikely," "agree . . . disagree," "probable . . . improbable," and "true . . . false." Placement and directionality of the items was randomized. The mean of the four items, scored from -3 (unlikely) to +3 (likely) was taken as a measure of intent.

#### Demographic and Social Data

In addition to measurement of the preceding variables, information was collected on the age, sex, marital status, occupation, and

educational level of the respondents. This demographic data has been linked with the likelihood of performing physical exercise (Harris, 1979). Because childhood experiences have been related to the practice of health behaviors (Mechanic, 1979), these were also assessed. Respondents were asked whether either parent regularly exercised when the subject was a child. One study of exercise habits revealed that "lack of time" was one of the reasons most frequently given for not exercising (Harris, 1979). To assess the effect of this variable on exercise performance, subjects were asked to indicate the amount of free or leisure time available to them each day. Because marriage to a person who exercises regularly has been found to be associated with a more favorable outlook on exercise (Mackie, 1975), married subjects were asked if their spouse exercises regularly. Finally, respondents were asked to indicate whether or not they wished to receive a summary of the results of the study upon its completion.

### Directions

The directions accompanying the questionnaire briefly stated the purpose of the study. The importance of responses from exercisers and non-exercisers alike was emphasized. The technique of probability estimation was explained and examples of the kinds of questions contained in the instrument were given. Finally, the respondent was assured that confidentiality would be maintained and thanked for his/her participation in the study.

In summary, the original questionnaire included two measures of behavioral intent, two measures of attitude toward the act, and two measures of subjective norms. The purpose of these two measures was to provide an estimate of the convergent validity of the primary components of the behavioral intent model. It was planned to drop one measure of each component from the final form of the questionnaire. The elicitation technique had yielded 16 salient consequences of exercise and these were included in the questionnaire. The respondent was asked to estimate the probability that each consequence would result from exercise, and then to evaluate the consequence on a seven-point "good-bad" scale. The respondent also was asked to estimate the probability that each of the four salient referents would wish him/her to exercise, and then to indicate on a seven-point "likely . . . unlikely" scale the degree to which he wished to comply with these referents. The numbers of the questions corresponding to the variables of the model are shown in Table 1.

Table 1  
Number of Question(s) Operationalizing  
Variables in the Original Form  
of the Questionnaire

Variable	Question No.
Behavioral Intent - Probability Estimate	1
Behavioral Intent - Probability Scale	22
Attitude Summary - Scale	3
Attitude Summary - Probability Estimate	4
Subjective Norms - Scale	2
Subjective Norms - Probability Estimate	21
Consequences and Evaluations	5-20
Normative Beliefs and Motivation to Comply	23-26

This form of the questionnaire was submitted to five judges; two doctorally prepared nurses, a social scientist skilled in survey research, a professor of health and physical education, and a psychologist-statistician who had worked with the behavioral intent model (see Appendix A). These five persons were asked to evaluate the instructions and the body of the questionnaire for content and clarity. A copy of the rating sheet used by the judges is appended (see Appendix B). The judges' comments regarding the wording of various items were incorporated in the questionnaire. It was recognized that the "good-bad"

evaluative scale was not entirely appropriate for all the "consequences of exercise questions." Some items, for example, "injury to muscles and joints," would have a common direction of preference. It was decided to retain the use of "good-bad" in the evaluation of all consequences but to instruct subjects to include the concept of "important-unimportant" when evaluating consequences.

The second draft of the original questionnaire was administered to a randomly selected sample of 31 faculty and staff of one of the regional universities. The same questionnaire was readministered to these subjects four weeks later. Data from the two administrations of the questionnaire was used to estimate the test reliability.

#### Reliability and Validity of the Instrument

The questionnaire items proved to have satisfactory test-retest reliability and convergent validity. The two measures of behavioral intent had test-retest correlations of .89 (for the probability estimate) and .92 (for the four-item probability scale). The two measures had a mean convergent validity of .94 on the two administrations of the test. The two summary statements of attitude had test-retest correlations of .91 (for the nine-item scale) and a .75 (for the probability estimate). These measures had a mean convergent validity of .78. The two statements of subjective norms had test-retest reliabilities of .90 (for the four-item probability scale) and .61 (for the probability estimate). The mean convergent validity for these variables was .74. The test-retest reliability coefficient for the sum of

the products of beliefs about the consequences of exercise and the evaluation of these beliefs ( $\sum B_i e_i$ ; the attitudinal component) was .83. The test-retest reliability of the sum of the normative beliefs and the motivation to comply ( $\sum NB_j MC_j$ ; the normative component) was only .33. When the "motivation to comply" variable was omitted from the calculations, the test-retest coefficient rose to .83. It was recognized that the "motivation to comply" variable appeared to be unstable. It was decided to retain the variable in the final form of the questionnaire and further assess its contribution to the prediction of behavioral intent. The reliability and validity data are summarized in Table 2 and Table 3.

Table 2  
Test-Retest Correlation Coefficients and the Question  
Number(s) Corresponding to Each Variable

Variable	r	Question Number Original Questionnaire
Behavioral intent measured by a probability estimate	.89	1
Behavioral intent measured by a probability scale	.92	22
Summary statement of attitude measured by a nine-item scale	.91	3
Summary statement of attitude measured by a probability estimate	.75	4
Summary statement of subjective norms measured by a four-item scale	.90	2
Summary statement of subjective norms measured by a probability estimate	.61	21
Sum of beliefs re consequences and the evaluations of beliefs ( $B_i$ ei)	.83	5-20
Sum of normative beliefs and the motivation to comply ( $NB_j$ MC <sub>j</sub> )	.33	23-26
Sum of normative beliefs alone ( $NB_j$ )	.83	23-26

Table 3  
Mean Convergent Validity of the Measures of  
Behavioral Intent, Attitude Toward the  
Act, and Subjective Norms

Variable	Mean Convergent Validity
Behavioral Intent	.94
Attitude Toward Act	.78
Subjective Norm	.74

The content validity of the questionnaire is supported by the elicitation procedure used to identify the consequences and referents contained in the instrument. The consequences are similar to those discussed in the literature on exercise.

#### Predictive Power of the Model

Behavioral intent, the criterion variable, was measured in two ways. One measure consisted of an estimate (from zero to 10) that the respondent would exercise as specified during the next month. The second measure of intent was a four-item probability scale. Both "intent" measures correlated reasonably well with the predictor variables of the model. Table 4 summarizes the relationships between the two measures of intent and the variables of: attitude toward the act, subjective norms, beliefs about the consequences of exercise, and evaluations of these beliefs ( $\sum B_i e_i$ ) and normative beliefs and motivation to comply ( $\sum NB_j MC_j$ ). It should be noted that the correlations

between the two measures of intent and the sum of normative beliefs and the motivation to comply was quite low. These correlations rose dramatically when the "motivation to comply" was excluded.

Table 4  
Correlations of Predictor Variables with  
Two Measures of Behavioral Intent

Predictor Variable	BI - Probability Statement	BI - Probability Scale
Attitude Toward Act	.69	.71
Subjective Norms	.45	.53
$\sum B_i e_i$	.52	.59
$\sum NB_j MC_j$	.18	.23
$\sum NB_j$	.43	.49
$\sum B_i e_i + \sum NB_j MC_j$	.53	.60
$\sum B_i e_i + \sum NB_j$	.53	.60

It should also be noted that correlations between the predictor variables and the four-item probability scale measure of intent tend to be slightly higher than are those between the predictor variables and the probability statement intent measure. The correlation of .60 between one measure of intent and the sum of beliefs, evaluations of beliefs and the normative variable is consistent with that reported in literature. Ryan and Bonfield (1975) report that the average correlation between the predictor and criterion variables in studies utilizing

the behavioral intent model is .60. A copy of the original questionnaire may be found in Appendix G.

### Data Collection

Following the second administration of the original questionnaire, the 31 subjects were asked to identify any problems associated with the instrument. No lack of clarity or other difficulty was reported by the respondents. It was determined that the questionnaire could be self-administered, that the directions were easily understood, and that the terms employed in the questionnaire were in general usage. Analysis of the two sets of responses did lead to a few revisions in the questionnaire. These changes were as follows:

1. Wording of the instructions was changed slightly to clarify the concept of "important" and "unimportant" in the evaluation of consequences likely to have a common direction of preference.
2. One of the examples used in the instructions was changed to make it more like an actual questionnaire item.
3. Wording of two of the consequences of exercise items was revised to increase their specificity.
4. Three new "consequences of exercise" items were added. These items reflected barriers to the practice of exercise frequently reported in the literature and mentioned by the 31 respondents.

5. The original draft of the questionnaire contained two measures of intent, of the summary statement of attitudes toward exercise, and of subjective norms. The purpose of these two measures was to provide an estimate of the convergent validity of the items. The probability estimate measures of attitudes toward exercise (A act) and subjective norms (SN) were dropped from the final form of the questionnaire.

It had been planned to delete the four-item probability scale measure of intent from the final questionnaire. However, the finding that this scale was slightly more stable and had a slightly higher correlation with the predictor variables, led to the decision to retain the scale. Because the probability estimate of intent provided a clear and unequivocal measure of behavioral intent, and because many studies utilize a single-item measure of intent, the probability estimate was used as the intent measure in all data analyses. The four-item probability scale provided a confirmatory measure of intent. Correlations between the predictor variables and both measures of intent were computed.

The final form of the questionnaire (see Appendix H) contained two measures of behavioral intent, one measure of a summary statement of attitude toward the act, and one measure of summary statement of subjective norms. There were 19 items measuring beliefs about the consequences of

exercise, and 19 items evaluating these consequences. Normative beliefs concerning four referents were assessed, as was the motivation to comply with these referents. Demographic and social data were gathered concerning the age, sex, marital status, level of education, and occupation of the respondent. The subjects were asked to indicate whether their spouse and parents exercised and the amount of leisure time available to them. The number of questions corresponding to the model's variables in the final form of the questionnaire are shown in Table 5.

Table 5  
Number of Question(s) Operationalizing Variables  
in the Final Form of the Questionnaire

Variable	Question Number
Behavioral Intent - Probability Estimate	1
Behavioral Intent - Probability Scale	23
Summary Statement of Attitude	3
Summary Statement of Subjective Norms	2
Consequences and Evaluations	4-22
Normative Beliefs and Motivation to Comply	24-27

#### Distribution of the Questionnaire

Following these minor revisions in the questionnaire, the instrument was professionally printed. The list of the 200 faculty and staff members selected to receive the questionnaire was updated. Current addresses and/or telephone numbers were obtained. Seven persons had

left the employ of the university. Replacements for these subjects were selected by choosing the next available name on the list below that of the original subject. Ten days before the questionnaire was sent, letters were mailed to each of the 200 subjects. The letter advised that the person's name had been selected at random from a list of faculty and staff at the university for inclusion in a study of attitudes toward exercise. The letter stated that the person would soon receive a copy of the questionnaire and asked for his/her assistance. The need for responses from exercisers and non-exercisers alike was emphasized. The letter served two purposes: it may have helped to increase the response rate (Babbie, 1973), and it provided a check on the adequacy of addresses. Three letters were returned as undeliverable and these addresses were once again checked with the employing university.

Ten days following the mailing of the letter, the printed questionnaire was mailed to the 200 subjects. A cover letter explaining the purpose of the study and the rights of the subjects was included. A stamped, addressed return envelope was also included. Subjects were advised that the questionnaires were numbered to permit identification but that confidentiality would be preserved. They were also told that they would be contacted by telephone on one occasion following the return of the questionnaire. As the questionnaires were returned, a record was kept of the date of receipt. Nineteen days following the mailing of the questionnaire, a postcard was sent to those persons who had not yet returned the questionnaire. The postcard again asked for

the person's participation in the study. Two weeks following the mailing of the postcard, a second copy of the questionnaire was sent to all persons who had not yet responded to the study. This second mailing of the questionnaire also included an explanatory cover letter and a stamped, addressed return envelope. No further attempt was made to contact non-responders.

Despite the fact that the questionnaire was first sent out shortly before final examination week and the conclusion of the school year, the participation in the study was very good. Ultimately, 160 of the 200 questionnaires were returned for a response rate of 80 percent. Of these 160 questionnaires, 17 (10.7%) were unusable because the respondent was either less than 30 years of age or more than 55 years of age. Another eight questionnaires (5%) were either incomplete or had the identifying number removed. These 25 questionnaires were excluded, leaving 135 usable questionnaires for data analyses.

One month after the returned questionnaire had been received, attempts were made to contact each respondent by telephone. The respondent was asked whether he/she had exercised within the last month. Those persons who responded affirmatively were asked to estimate the amount of time they spent on exercise each day, the number of days per week they exercised, and the number of weeks during the past month in which they had exercised. They were also queried as to the kind of exercise they did. Those persons who indicated that they had not exercised were not asked the reason for this. However, a number of

subjects volunteered information about not exercising and these comments were recorded. At least four attempts were made to reach each subject, calling both the home and the employing institution. Eventually 121 of the 135 subjects were contacted (89.6%). The remaining 14 subjects were either out of the state (in three cases out of the country), had disconnected telephones with no new listing available, or did not answer the telephone despite several calls placed at varying times of day and evening. Those 121 subjects who were queried about their exercise activities were classified either as exercisers or non-exercisers depending upon their self-reported behavior. Those persons who had achieved 75 percent or more of the behavioral criterion (exercised at least three days per week, 15 minutes a day for three weeks of the month) were classified as "exercisers." The remainder were classified as "non-exercisers."

#### Treatment of Data

The data treatment procedures chosen for this study were those which most effectively facilitated attainment of the research goals. In this investigation, data were obtained from three sources: the original questionnaire, the final questionnaire, and the telephone contact with the subjects. The statistical treatment of each of these sets of data is discussed.

#### Data from the Original Questionnaire

1. As previously reviewed, test-retest data from two administrations of the original questionnaire were obtained. Although

test-retest data may be affected by memory, or by real changes in the variables over time, it is the only appropriate means for establishing the reliability of an instrument of this sort (DuBois, 1965; Guilford and Fruchter, 1973).

2. Data from the original questionnaire also contributed information concerning the convergent validity of the primary variables of the model. The calculation of the correlation between two different measures of the same thing yields an estimate of the convergent validity as discussed by Campbell and Fiske (1959). Fishbein and Ajzen (1975) recommend this approach to the determination of the convergent validity of the model's major components.

#### Data from the Final Questionnaire and Self-Reported Behavior

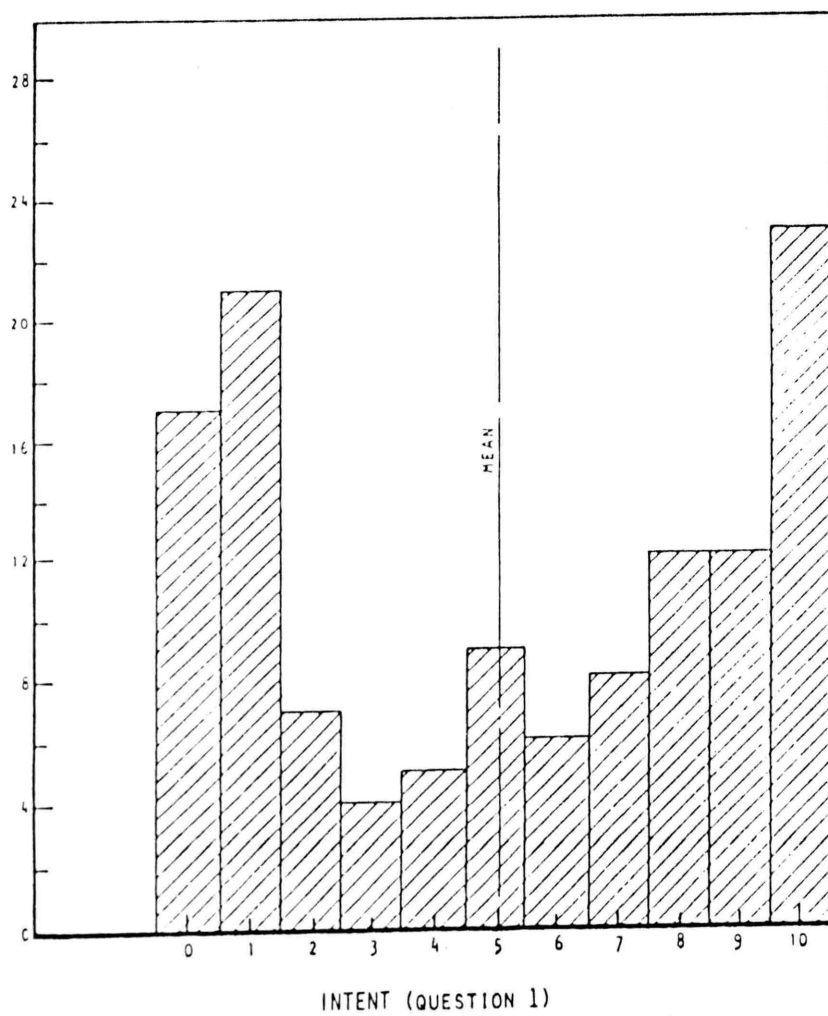
1. Simple correlations between intent to exercise and attitude toward the act and subjective norms were computed. These correlations permit a measure of the relationship between each of the major predictor variables and the criterion variable (Fishbein and Ajzen, 1975; McCarty, 1981).
2. Using the probability statement as a measure of the criterion variable, behavioral intent, a regression equation was developed with the two major predictor variables, attitude toward the act and subjective norms. Standardized regression coefficients (beta weights) were calculated as estimates of the weights ( $w_1$ ,  $w_2$ ) of the predictor

variables. The use of regression equations and standardized regression coefficients gives an estimate of the contribution of each component to the explanation of variance in intent. The "student's t" distribution was used to test for significance.

3. Simple correlations between the summary statement of attitude and the sum of beliefs about the consequences of exercise and the evaluation of these beliefs were computed. Similar correlations between the summary statement of the subjective norms and the sum of normative beliefs and motivation to comply were calculated. These correlations yield a measure of how well the global components A act and SN were estimated by the sub-components  $\sum B_i e_i$  and  $\sum NB_j MC_j$ .
4. The correlation between intent to exercise and self-reported exercise behavior was computed. The point-biserial correlation coefficient is utilized when one measure yields normal dichotomous data and the other interval or ratio data (Glass and Stanley, 1970).
5. Given the significant correlation between behavioral intent and exercise behavior, the relationship between exercise behavior, and the major components of intent was examined, using the point-biserial correlation coefficient.

6. In view of the significant correlations between attitude toward the act and its subcomponents, and between the attitudinal predictor variable and intent, the contribution of  $\sum B_i e_i$  to BI was assessed. Significant regression coefficients for this subcomponent would indicate that intenders could be distinguished from non-intenders by means of their perceptions of the consequences of exercise. These distinctions, in turn, may identify approaches for the modification of exercise intent (Fishbein, Martensen and Sereno, 1973).
7. Differences between those who intended to exercise and those who did not were sought in terms of the subcomponent items, of the products of beliefs about the consequences of exercise ( $B_i$ ), and evaluation of these consequences ( $e_i$ ). Exercise intenders were defined as those who indicated that the probability they would exercise within the next month was equal to or greater than 6 chances in 10. Non-intenders were those who estimated the probability that they would exercise at 5 chances in 10 or less. Thus, the probability of exercise estimated by "intenders" was above the mean, while that of the "non-intenders" fell at or below the mean. As shown in Figure 1, this definition of "intender" and "non-intender" is supported by the frequency of

Figure 1



Frequency of responses to Question 1 -- Intent to Exercise

each level of intent. The mean vectors of the products of beliefs and evaluation of beliefs were computed for both groups.

8. Differences in mean vectors between the two groups for the products of beliefs about consequences, the evaluation of consequences, were calculated. The Hotelling  $T^2$  statistic was used to test for significant differences between the two groups (Bowman & Fishbein, 1978; Morrison, 1967).
9. The simultaneous confidence interval was used to identify those Bi ei items on which intenders and non-intenders differed significantly (Bowman & Fishbein, 1978; Morrison, 1967).
10. Correlations between demographic and social data and intent to exercise were calculated. One variable was found to be significantly correlated with intent. To test the claim of the sufficiency of the model, the partial correlation coefficient of that external variable with behavioral intent was computed, holding the components of attitude toward the act and subjective norms to constant.

Remaining Data from the Telephone Contact

1. Descriptive data portraying the kinds of exercise reported, the time spent exercising, and reported barriers to exercise were prepared.
2. Correlations between exercise behavior and personal, social, or demographic data were computed using the point-biserial correlation.

## CHAPTER 4

### ANALYSIS OF DATA

This chapter is divided into three sections. First, the sample is described. Respondents are characterized according to demographic and social variables. Respondents are compared to the original sample in terms of employing institution and sex. Second, the findings of the study are reported. The results will be organized according to the nine research questions. Finally, a condensed review of all findings is presented.

#### Description of Sample

The sample to whom the final form of the questionnaire on attitudes toward exercise was sent consisted of 200 randomly selected faculty and staff from two regional Oklahoma universities. Of these, 83 were women and 117 were men. Eighty percent of the subjects responded; 160 completed forms were returned. Seventeen of the respondents failed to meet the age requirement for inclusion in the sample. Five questionnaires were incomplete and three had the identifying number removed. These 25 questionnaires (12 from one institution and 13 from the other) were excluded from the data analysis, leaving 135 subjects in the final sample. Of these subjects, 73 were male and 62 were female. Seventy-six of the subjects were employed by one university

(Institution "A") and 59 were employed by the second university (Institution "B"). Self-reported exercise behavior was obtained for 121 of the 135 subjects in the final sample (89.6%). Of this contacted sample, 73 were employed by Institution "A" and 48 by Institution "B". These data are summarized in Table 6.

Table 6  
Comparison of Original Sample, Final Sample,  
and Contacted Sample by Sex and  
Employing Institution

Sample	Number	M	%	F	%	"A"	%	"B"	%
Original Sample	200	117	58.5	83	41.5	100	50	100	50
Final Sample	135	73	54.1	62	45.9	76	56.3	59	43.7
Contacted Sample	121	68	56.1	53	43.9	73	60.4	48	39.6

These figures show that the final sample was representative of both sexes and of both universities. The composition of the final sample is similar to that of the original sample in terms of these variables. The ratio of men to women is also preserved in the contacted sample.

The 135 respondents in the final sample were relatively well distributed across the five age categories. Table 7 displays the number of subjects in each age category.

Table 7  
Age of Subjects in Final Sample

Age	Number	Percent
30-34	26	19.27
35-39	28	20.74
40-44	22	16.29
45-50	31	22.96
51-55	28	20.74
		<u>100.</u>

A very large majority of the respondents reported themselves to be married. One hundred-three, or 76.29 percent fell into this category. Of the remaining 32 subjects, 14 were never married, six widowed, and 12 were separated or divorced. As would be expected in a sample of university faculty and staff, the educational level was high. Table 8 illustrates the distribution of the sample by education.

Table 8  
Highest Level of Schooling Completed  
by Subjects in Final Sample

Level of Schooling	Number	Percent
Highschool	2	1.5
Some College Work	17	12.8
Baccalaureate Degree	9	6.8
Master's Degree	27	20.3
Some Work Toward Doctorate	36	27.1
Doctorate	42	31.6
*Total	<u>133</u>	<u>100.</u>

\*Two subjects did not report their educational level.

Of the 130 subjects who reported their occupation, 78 or 60 percent listed themselves as faculty while 52 or 40 percent held staff positions. Estimates of free or leisure time available to the subjects are summarized in Table 9.

Table 9  
Estimates of Leisure Time Available  
to Subjects in Final Sample

Amount of Leisure Time in Hours	Number	Percent
Less than one	19	14.1
One to two	49	36.3
Two to three	47	34.8
More than three	20	14.8
Total	135	100.

Only 37 of the 103 married respondents (36%) reported that their spouse exercised regularly. Of the 131 subjects who responded to the question concerning parental exercise, 14 (10.7%) stated that one or both of their parents had exercised regularly. It appears that the majority of the respondents in this study have neither the example of a parent nor that of a spouse to encourage exercise behavior.

### Findings

The findings of the study are reported as they pertain to the research questions. Each of the nine questions will be discussed in turn.

1. What are the modal salient beliefs with regard to exercising?

There are no absolute criteria for establishing the modality and saliency of beliefs. It is assumed that salient outcomes are those of which the individual is aware or conscious. Therefore, salient beliefs would have a high probability of being elicited in a free association situation (Ryan and Bonfield, 1975). It seems likely that these beliefs will be mentioned first when an individual is asked to name the consequences of a behavior. Additionally, those outcomes which are most important or salient are likely to be seen as very probable or improbable, and to be evaluated more positively or negatively. The elicitation technique recommended by the developers of the behavioral intent model was employed in this study. Forty persons, randomly selected from the same population as that from which the final sample was drawn, were interviewed. These persons were asked to list the consequences of exercise. A total of 43 consequences were elicited. From this list, the 16 consequences mentioned most frequently and early in the discussion were selected. Three related consequences often identified in the literature as barriers to exercise and mentioned by subjects of the test-retest sample were added. Thus, 19 consequences of exercise were identified as being modal and salient.

To examine Fishbein's contention that salient beliefs are more apt to be perceived as likely or unlikely, and to be

evaluated positively or negatively, the mean probability and evaluation of each salient belief was computed. The standard deviation of responses for each consequence was also calculated. The possible range for belief statements ranged from +5 to -5, and for the evaluation of consequences the possible range was from -3 to +3. In those items where a common direction of preference might be assumed, respondents were asked to give a low evaluation to those consequences considered to be "unimportant." By the structure of the behavioral intent model, consequences rated as "bad" and/or "unimportant" are considered to be unmotivating. Table 10 lists the salient outcomes of exercise with the mean belief and evaluation score for each.

Table 10

Mean Belief, Evaluation of Belief, and Standard  
Deviation for 19 Salient Outcomes of Exercise

Question Number	Belief Re Consequences	Probability of Belief	Std. Dev. of Belief	Eval. of Belief	Std. Dev. of Evaluation
4	Eat more	-1.1	3.2	-1.4	1.8
5	More energy	2.6	2.7	2.6	.74
6	Feel good about myself	3.1	2.5	2.7	.67
7	Day more structured	1.9	2.9	.75	1.7
8	Lose weight	1.5	3.1	1.6	1.7
9	Injury to muscles or joints	-2.1	2.9	-2.2	1.7
10	Feel better	3.5	2.0	2.7	.76
11	Interfere with daily routine	.56	3.4	- .44	1.7
12	Increased strength	3.5	2.0	2.1	1.2
13	More alert mentally	1.9	2.9	2.5	1.1
14	Health condition aggravated	-2.1	3.2	-2.2	1.6
15	Stay healthy and resist colds	1.7	2.9	2.8	.69
16	Strengthened heart and lungs	3.7	1.9	2.7	.92
17	Time from usual responsibilities	- .06	3.5	- .44	2.0
18	More relaxed	2.7	2.5	2.4	1.1
19	Muscle ache or fatigue	.32	3.1	-1.1	1.8
20	Improved appearance	2.1	3.0	2.2	1.1
21	Too tired for daily tasks	-2.6	2.9	-1.6	2.2
22	Take time now spent on relaxation	- .4	3.5	1.1	1.6

Six consequences or outcomes of exercise were rated as quite probable (above 2.5). These were: having more energy, feeling good about myself, feeling better, having increased strength, strengthened heart and lungs, and being more relaxed. All of these outcomes were given high positive evaluations (above 2.0). One consequence was seen as relatively unlikely, that of being too tired to carry out daily tasks. It should be noted that those consequences which would intuitively appear to be "good" all received positive evaluations while those which would normally appear to be "bad" received negative evaluations. This is strong evidence that the respondents understood the questionnaire directions and answered appropriately.

2. What persons or groups influence the decision to exercise?

The same procedure outlined in the preceding discussion of consequences was utilized to identify referents. The randomly selected 40 persons were asked who might wish them to exercise or not to exercise. The range of responses was quite restricted; 12 subjects stated that no one would serve as a referent for exercise. "Spouse" was mentioned most frequently by those who did identify referents, followed by children, siblings, friends, and boss or co-workers. Surprisingly, only two persons mentioned "doctor" and no one mentioned this referent first or second. Accordingly, "doctor" was not included as a referent in the questionnaire. The questionnaire asked respondents to estimate the probability that each of the

referents would wish him/her to exercise, and then to state the extent to which they wanted to comply with this perceived desire. Table 11 summarizes the data on the four referents.

Table 11

Mean Belief re Wishes of Referents, Motivation to Comply with These Referents, and Standard Deviations for Four Referents re Exercise

Question Number	Referents	Beliefs re Wishes of Referents	Standard Deviation of Beliefs	Motivation to Comply	Std. Dev. of Motivation to Comply
24	Spouse or housemate	2.1	3.7	.38	2.6
25	Other family members	.08	3.5	.24	1.9
26	Friends	- .49	3.4	-.50	1.9
27	Boss or Coworkers	-1.4	3.3	-.70	1.8

As this table illustrates, only one referent, spouse or housemate, was seen as likely to care whether or not the respondent exercised. Beliefs concerning the wishes of other family members and friends were very close to zero. The standard deviations were large, showing considerable variation in the responses. The mean motivation to comply with these referents was approximately zero, except in the case of boss or coworkers. There, a slight negative trend can be observed. If a high belief probability is to be taken as one of the criteria for

saliency, it would appear that only spouse or housemate serve as a referent for exercise.

3. How stable are attitudes and normative beliefs regarding exercise?

The stability of attitudes and normative beliefs regarding exercise was measured by means of the test-retest procedure. Thirty-one randomly selected subjects took the questionnaire on two occasions, four weeks apart. Attitudes were shown to be quite stable. The summary statement of attitude, as measured by the nine-item scale, had a test-retest score of .91. Attitude, as measured by the sum of beliefs about the consequences of exercise and the evaluation of these beliefs ( $\sum B_i e_i$ ), had a test-retest correlation of .83. Normative beliefs, as measured by the four-item scale of subjective norms, also were stable with a test-retest value of .90. However, normative beliefs as measured by the sum of beliefs about the wishes of referents and the motivation to comply with these referents ( $\sum NB_j MC_j$ ) scored only .33 in the test-retest calculations. When normative beliefs were measured only by the sum of the beliefs about the wishes of referents ( $\sum NB_j$ ), the test-retest figure rose to .83. The data in the present investigation show that the "motivation to comply" variable is unstable and does not behave predictably or in ways similar to the other variables of the model.

4. What are the relative contributions of the attitudinal and normative variables to the intent to exercise and to exercise behavior?

The behavioral intent model posits that intent to perform an action is contingent upon attitudes toward that action and subjective norms relative to the action. "Intenders" were defined as those who indicated that the probability they would exercise within the next month was equal to or greater than six chances in 10. Those persons estimating the probability that they would exercise as defined on the study as five chances in 10 or less were classified as "non-intenders." Of the 135 respondents, 66 (48.8%) were intenders and 69 (51.2%) were non-intenders. The contribution of attitudes toward the act of exercising (A act) and subjective norms (SN) to intent was examined in several steps. First, the simple correlations between intent and the predictor variables of A act and SN were calculated. The correlation between intent to exercise and the nine-item measure of attitude toward the act was .77 ( $n = 135$ ,  $p < .01$ ). The correlation between the four-item summary of subjective norms and intent was .41 ( $n = 135$ ,  $p < .01$ ). Next, a stepwise multiple regression analysis was performed, using intent to exercise as the criterion variable. These data are shown in Table 12.

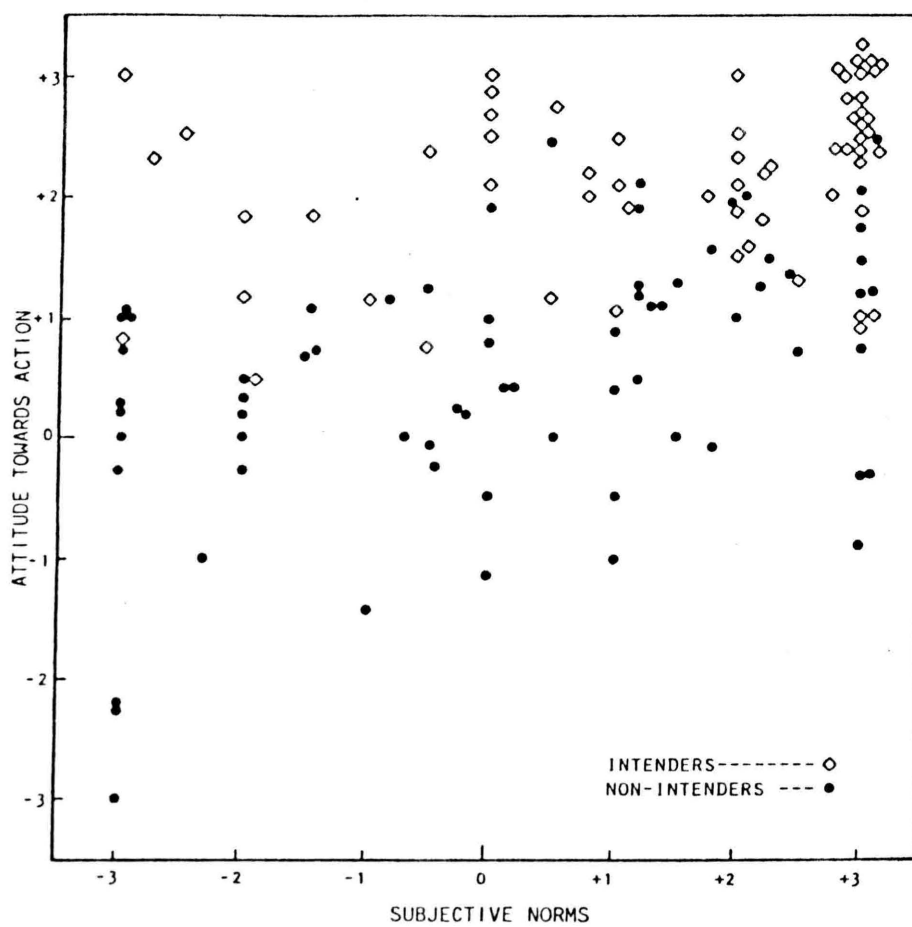
Table 12  
Correlations, Regression Co-efficients and  
Multiple Correlation of A act and  
SN on Intent to Exercise

Predictor Variables	Correlations		Regression Coefficients			Multiple Correlations		
	Simple	df	Standardized Regression Coefficient	t value	df	R	F	df
A act	.77**	133	.76**	11.74	132			
SN	.41**	133	.03	.399	132	.77	96.2**	2/132

\*\*p < .01

Although the simple correlations between both A act and SN with intent were significant, Table 12 reveals that subjective norms contribute almost no unique variance to the multiple regression and analysis. The standardized regression coefficients are estimates of the weights ( $W_1$ ,  $W_2$ ) of the predictor components of the model. The weight of the "subjective norms" variable is so small as to make its contribution to prediction of intent negligible. Moreover, the multiple correlation coefficient, R, is no greater than the simple correlation between attitude toward the act and intent. For this sample, at least, the explanation of the 59 percent of the variance in intent accounted for, came entirely from attitude toward the act. Figure 2 displays the effect of the attitudinal and normative variables on intent. Although many intenders had high scores on both the attitudinal and normative components, intenders fall at any level of subjective norms, from -3 (very

Figure 2



Effect of attitudinal and normative variables on intent.

low) to +3 (very high). By contrast, only three intenders fall below a score of +1 (favorable) on the attitudinal scale. It is interesting to note that subjective norms and attitude toward the act were themselves correlated ( $r = .51$ ,  $n = 135$ ,  $p < .01$ ). This finding raises the question about the assumption of the model that the predictor variables are independent of one another.

To see how well the subcomponents of the model estimated the predictor variables, the correlation between the sum of beliefs and the evaluation of these beliefs ( $\sum B_i e_i$ ) and attitude toward the act was computed. Similarly, the correlation between subjective norms and the sum of normative beliefs and the motivation to comply ( $\sum NB_j MC_j$ ) was calculated. The correlation of  $\sum B_i e_i$  with A act was .73 ( $n = 135$ ,  $p < .01$ ), indicating that beliefs about the consequences and evaluation of these consequences capture much of the variance in attitude toward the act. However, the correlation between the summary statement of subjective norms and normative beliefs and motivation to comply was only .09. When the "motivation to comply" variable was dropped, the correlation of subjective norms with normative beliefs rose to .60 ( $n = 135$ ,  $p < .01$ ). This finding confirms the great variability and instability of the "motivation to comply" component. For this reason, the "motivation to comply" variable was not used in further computation of the normative component of the model.

Given the high correlations between the primary components of the model and their respective subcomponents: beliefs about consequences,

evaluation of beliefs, and normative beliefs, these estimates may be used in place of attitude toward the act and subjective norms in the prediction of intent. When this was done, the multiple correlation coefficient was still highly significant,  $R = .65$  ( $n = 135$ ,  $p < .01$ ). However, only  $\sum B_i e_i$  received a significant weight (.61) in the regression equation. The weight of  $\sum NB_j$  was only .07. This again confirms that only the attitudinal component of the model contributed to the explanation of intent.

Because it is exercise behavior which ultimately affects well-being, it is appropriate to examine the associations between behavior and the components of intent. For the 121 subjects for whom data on exercise behavior were obtained, the correlation of behavior (b) with the summary statement of attitude (A act) was .49 ( $n = 121$ ,  $p < .01$ ). The correlation between the subjective norms summary statement (SN) and behavior was .29 ( $n = 121$ ,  $p < .01$ ). The subcomponents of attitude,  $\sum B_i e_i$ , correlated .46 ( $n = 121$ ,  $p < .01$ ) with behavior while the sum of normative beliefs,  $\sum NB_j$ , had a correlation with behavior of .31 ( $n = 121$ ,  $p < .01$ ). These data are summarized in Table 12.

Table 13  
Correlation of the Model Components  
with Behavior

Model Component	Correlation with Behavior
Summary of Attitude - Act	.49
Summary of Subjective Norms - SN	.29
Sum of Products of Beliefs and Evaluations    Bi ei	.46
Sum of Normative Beliefs    NB	.31

Although it is intent, not behavior, which is the criterion variable of the behavioral model, the model's components do explain a significant amount of variance in exercise behavior.

5. What is the relationship between intent to exercise and self-reported exercise behavior?

Intent to exercise was measured by the statement of probability, ranging from zero chances in 10 to 10 chances in 10, that the respondent would exercise during the next month. Exercise behavior was ascertained by means of a telephone call to the respondent one month following return of the questionnaire. The criteria for "exercising" were that the respondent must have spent a minimum of 15 minutes a day, three days a week, for three of the past four weeks in running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics. These criteria reflect the necessity for a

continuing commitment to an exercise program if the benefits of physical activity are to be realized. These subjects who did exercise at least as often as specified were scored as "1". Others were scored as "0". The correlation (point biserial correlation coefficient) between intent and self-reported behavior for the 121 people contacted was .65 ( $n = 121$ ,  $p < .001$ ). This is a highly significant finding.

6. Can exercise intenders be distinguished from exercise non-intenders on the basis of their attitudes toward exercise?

Since only the attitudinal component of the model received a significant regression weight in the prediction of exercise intentions, it was this variable which was examined for differences between intenders and non-intenders. The attitude toward the act (A act) was significantly correlated with its subcomponent beliefs about exercise and evaluations of beliefs (Bi ei) items. Therefore, the 19 Bi ei items were examined to determine differences between intenders and non-intenders on the basis of these items.

First, it was necessary to establish that the two groups, intenders and non-intenders, differed significantly in terms of their attitudes toward exercise. The model posits that attitudes toward a specified behavior are determined by beliefs about the consequences of behavior and the evaluation of these consequences. Therefore, the mean vectors of the

19 Bi ei items for intenders and non-intenders were compared utilizing Hotelling's  $T^2$  statistic. Differences between the two groups were highly significant ( $T^2 = 111.2$ ,  $F = 4.96$ ,  $p < .01$ ). Intenders and non-intenders clearly differ in their beliefs about the consequences of exercise and the evaluation of these consequences.

The simultaneous confidence interval procedure was used to identify those specific Bi ei items on which exercise intenders and exercise non-intenders differed. Table 14 shows the mean difference and the upper and lower limits at the 99.5 percent confidence level for the 19 Bi ei items.

Table 14  
Simultaneous Confidence Intervals for  
Nineteen Belief X Evaluation Items

Question Number	Mean Difference	Lower Limit	Upper Limit
4	4.94	3.63	6.25
5	6.84	5.53	8.15
6	6.88	5.57	8.19
7	2.01	.70	3.32
8	1.39	.08	2.70
9	4.98	3.67	6.29
10	5.39	4.08	6.70
11	3.86	2.55	5.17
12	2.78	1.47	4.09
13	6.24	4.93	7.55
14	8.52	7.21	9.83
15	5.59	4.28	6.90
16	3.05	1.74	4.36
17	3.20	1.89	4.51
18	4.54	3.23	5.85
19	4.33	3.02	5.64
20	2.35	1.04	3.66
21	5.33	4.02	6.64
22	-1.05	-2.36	.26

It can be seen that the confidence intervals of only one item, question 22, includes zero. Therefore, all of the Bi ei items with the exception of question 22 do distinguish between intenders and non-intenders. However, the lower limits of questions 7 and 8 are very close to zero. These questions may be contributing little to the explanation of differences between intenders and non-intenders.

Completing the study of differences between the groups, the mean scores on the individual belief and evaluation of belief items for intenders and non-intenders were examined. Table 15 summarizes these data.

Table 15

Mean Scores on Beliefs and Evaluations of Beliefs for  
Those Who Intend to Exercise and Those Who Do Not

Question Number	Perceived Consequences of Exercising at Least 20 Minutes, 4 Times a Week for a Month	Mean Belief Score (a)		Mean Evaluation Score (b)	
		Do not Intend to Exercise	Intend to Exercise	Do not Intend to Exercise	Intend to Exercise
4	Having a big appetite and eating more	-.83	-1.64	-1.3	-1.28
5	Having more energy	1.63	3.89	2.41	2.82
6	Feeling good about self	2.16	4.26	2.41	2.91
7	More structured day	1.97	1.54	.37	1.16
8	Losing weight	1.30	1.77	1.44	1.79
9	Injury to muscles/joints	-1.29	-2.89	-2.03	-2.44
10	Feeling better generally	2.71	4.32	2.44	2.98
11	Interference with routine	2.21	-1.09	-.57	-.35
12	Increased strength	3.43	3.72	1.97	2.35
13	Being more alert mentally	1.08	2.79	2.36	2.67
14	Having a health condition aggravated	-.87	-3.46	-2.21	-2.28
15	Staying healthy	.90	2.75	2.71	2.95
16	Strong heart and lungs	3.35	4.11	2.62	2.70
17	Taking time from responsibilities	-1.09	-1.39	-.54	-.25
18	Feel more relaxed	1.83	2.51	2.05	2.79
19	Cause muscle aches	.87	-.23	-1.11	-1.21
20	Improved appearance	1.90	2.42	2.05	2.44
21	Too tired for responsibilities	-1.86	-3.54	-1.24	-1.94
22	Time spent on exercise	.17	-.98	-.83	-1.39

- a. range from -5 (zero chances in 10) to +5 (10 chances in 10).  
b. range from -3 (very bad) to +3 (very good).

An examination of the tabled means reveals several interesting qualitative trends. With the exception of three items (11, 19, 22), intenders and non-intenders agreed on the sign, negative or positive, to be placed on the likelihood of the consequences. Consequences viewed as "good" by both groups were seen as more probable by the intenders, while negative consequences were seen as more likely by the non-intenders. The three items on which the sign of probability estimates of intenders and non-intenders differed were all negatively evaluated. In each case, intenders saw the consequence as unlikely while non-intenders viewed it as likely. Intenders and non-intenders agreed on the sign to be placed on the evaluation of each consequence. With the exception of item 7 which is equivocal, the positively evaluated consequences were rated more highly by intenders. In summary, the intenders and non-intenders disagreed on the likelihood of the consequences of exercise, but agreed on the sign of the evaluation of these consequences. Exercise intenders believed that "good" consequences were more likely to result from exercise and that "bad" consequences were less probable.

7. What is the rate and distribution of exercise habits among the sample studied?

The 121 persons who were contacted regarding their exercise behavior were very nearly evenly divided on this variable. According to their self-report, 62 (51.2%) did exercise and 59 (48.8%) did not. Of the 53 women in this contacted sample, 25

(47.2%) met the criteria for having exercised, while 37 of the 68 men (54.4%) did likewise. This finding suggests that gender is not significantly associated with the practice of exercise, for this sample.

Those persons who reported that they had exercised during the month following the return of their questionnaire were asked to specify the kind(s) of exercise performed. The time devoted to exercising in weeks, days, and hours also was recorded.

Brisk walking was the exercise most commonly mentioned by the respondents who exercised. Thirty-five persons reported that they walked on a regular basis to obtain exercise. Running or jogging was also common; 24 respondents obtained exercise in this way. Six persons regularly participated in aerobic dancing, either at home (using a record or tape) or as a part of a class. Five respondents rode stationary or mobile bicycles and three persons swam. Calisthenics or warm-up exercises were performed by 20 persons, in conjunction with other exercises. Nearly half the sample (27) reported that they engaged in more than one of the above-mentioned exercises and a few participated in as many as three. Table 16 summarizes the frequency and kinds of exercise reported.

Table 16  
Kinds and Frequency of Self-Reported  
Exercise Behavior

Kinds of Exercise	Frequency of Report*
Brisk Walking	35
Running or Jogging	24
Calisthenics	20
Aerobic Dancing	6
Bicycling	5
Swimming	3

\*27 respondents reported more than one exercise behavior.

Most of those persons who exercised did so regularly and frequently. Asked the number of weeks during which they had exercised in the month since the return of their questionnaire, 60 of the 62 "exercisers" responded "4". Two persons stated that they had exercised three weeks of the preceding month. Three persons had exercised for one or two weeks. They did not meet the criteria for "exercisers" and were placed in the non-exerciser group. The criteria specified that the person must have exercised at least three days per week for a minimum of 15 minutes each day. Most exercisers exceeded these minimum standards. Forty-nine persons exercised four or more days per week and 46 persons spent at least one-half hour on each exercise session. These data are summarized in Table 17.

Table 17  
Self-Reported Exercise Behavior in Weeks, Days,  
and Minutes for 62 "Exercisers"

Number of Weeks	Frequency Reported	Number of Days	Frequency	Number of Minutes	Frequency
1	-	6-7	17	75 or more	8
2	-	5	20	46 - 74	13
3	2	4	12	30 - 45	25
4	60	3	13	15 - 29	16
Total	62		62		62

The mean number of minutes spent on exercise per week was approximately 150. This figure would place the respondents in the "less active" category according to the Harris (1979) study of fitness in America.

Although non-exercisers were not asked to give reasons for their decision not to exercise, 27 volunteered such information. In essence, these respondents were either constrained from exercise by health problems (10) or lack of time (9), or felt that they obtained sufficient exercise performing the usual daily activities (8). Gardening, yard work, and ranching were cited as activities which provided sufficient physical exercise.

8. What, if any, demographic variables are associated with the intent to exercise or with exercise performance?

In this investigation, respondents were asked to provide information about a number of variables which previous studies have indicated may be associated with exercise. These variables included age, sex, marital status, whether either parent had exercised when the respondent was a child, educational level, occupation, and the amount of free or leisure time available to the respondent each day. Those subjects who were married were asked whether or not their spouse exercised regularly. In contrast to the findings of Harris (1979) and others, neither the age nor the sex of the respondent was significantly related to exercise intent or exercise behavior.

For those 103 subjects who were married, the correlation between the intent to exercise and whether or not one's spouse exercised was .35 ( $n = 103$ ,  $p < .01$ ). Respondents whose spouse exercised were more likely to have positive attitudes toward exercise, to see "most people who are important to me" as thinking that the subject should exercise, and to intend to exercise themselves.

9. Is the claim of the model to sufficiency supported or do other variables significantly increase its predictive power?

The claim of the behavioral intent to sufficiency means that any variable external to the model exerts influence on intent only through its action on the primary components of attitude toward the act and/or subjective norms. This claim

to sufficiency was tested by calculating the partial correlation of the external variable, spouse's exercise habits, with intent. The attitudinal component A act was held constant. Table 18 shows that the claim to sufficiency was supported.

Table 18  
Correlation Between Exercise Habits of Spouse  
and Intent to Exercise, with  
A Act Held Constant

External Variable	Correlation with Intent to Exercise		Partial Correlation with Intent	
			A Act Controlled	
	r	df	rp	df
Spouse's exercise habits	.35**	100	.18	.98

\*\*p .01

As can be seen, the correlation of spouse's exercise habits with intent becomes insignificant when attitude toward the act was held constant. This indicates that spouse's exercise habits influence intent by affecting the attitudes toward exercise. The exercise behavior of one's spouse was the only external variable found to correlate significantly with intent. This fact, and the finding that the correlation became insignificant when the component attitude toward the act (A act) was held constant, does lend support to the sufficiency claim of the model.

### Summary of Findings

The 19 consequences of exercise and four referents mentioned most frequently by a sample of faculty and staff were identified as the modal beliefs and referents regarding exercise. These consequences and referents were included in the questionnaire "Attitudes Toward Exercise" which was submitted to a randomly selected sample of 200 faculty and staff of two regional universities. There are no absolute criteria for establishing the salience of consequences or referents. It has been suggested that those consequences and referents whose evaluations and probabilities are most highly polarized are more likely to be salient. Data from 135 respondents to the questionnaire identified seven consequences and one referent as perhaps being salient in this sample. The consequences included: having more energy, feeling good about myself, feeling better in general, having increased muscle strength, strengthened heart and lungs, being more relaxed, and being too tired to carry out daily tasks. The one salient referent was spouse or housemate.

The stability of attitudes and normative beliefs regarding exercise was evaluated by means of test-retest procedure. The major components of the model had test-retest reliability estimates of .83 or above, with the exception of the "motivation to comply" variable. This component proved to be quite unstable, with a test-retest reliability of only .33.

An examination of the relative contribution of the attitudinal and normative variables to the prediction of intent revealed that only the attitudinal component carried a significant weight in the regression analyses. Although the normative component was significantly correlated with intent, it was also highly correlated with attitudes. It contributed almost no unique variance to the explanation of intent. This finding calls into question the assumption of the independence of the attitudinal and normative components. The subcomponents of attitude toward the act (A act), beliefs and the evaluation of beliefs, did provide a good estimate of A act. The correlation of  $\sum B_i e_i$  with A act was .73. However, the subcomponents of subjective norms (SN) normative beliefs, and the motivation to comply, correlated very poorly with subjective norms. When the "motivation to comply" variable was excluded from the computations, the correlation of SN with normative beliefs rose to .60. Not surprisingly, the subcomponents of attitudes toward the act,  $B_i e_i$  and of subjective norms,  $NB_j$ , were significantly correlated with intent ( $R = .65$ ,  $n = 135$ ,  $p < .01$ ) in the multiple regression analysis. However, only beliefs and evaluation of beliefs received a significant regression weight.

Intent to exercise was found to be highly correlated with self-reported exercise behavior one month later ( $r = .65$ ,  $n = 121$ ,  $p < .01$ ). This correlation is especially impressive in view of the month-long interval between the measure of intent and that of behavior. Moreover, the criteria for exercise required continued, repetitive behavior over

time, a fact that would tend to depress the correlation between intent and exercise performance.

The Hotelling  $T^2$  statistic was used to test for significant differences between intenders and non-intenders on the basis of the mean vectors of the 19 belief and evaluation of belief items. The two groups were found to be very significantly differentiated. The simultaneous confidence interval procedure established that only one of the individual belief and evaluation of belief (Bi ei) items failed to distinguish between intenders and non-intenders. Some qualitative trends were revealed by an examination of the mean scores of intenders and non-intenders on each of the belief and evaluation of belief items. Intenders and non-intenders agreed on the sign, positive or negative, to be attached to the evaluations of consequences. Intenders perceived the positive consequences to be more likely and the negative consequences less likely. Non-intenders saw the negative consequences as more probable and the positive consequences as less so.

The sample was nearly evenly divided in terms of self-reported exercises behavior. For those 62 persons who met the criteria for having exercised, walking was the most common form of activity. Running or jogging and calisthenics were also frequently reported. The exercisers devoted a mean of 150 minutes per week to their exercise activities.

Information was collected on several personal and demographic variables. These included age, sex, marital status, whether either

parent exercised, whether spouse exercises, occupation, education, and available leisure time. Only one variable, the exercise habits of the spouse, was found to be significantly correlated with intent.

The claim of the behavioral intent model to sufficiency was tested with the one "external" variable found to be significantly correlated with intent. The partial correlation of the exercise habits of the spouse with intent was computed, holding the component of attitude toward the act constant. Under these conditions, the correlation between the spouse's exercise habits and intent became insignificant. This finding supports the sufficiency claim of the model.

## CHAPTER 5

### SUMMARY OF THE STUDY

The problem addressed in this study was the identification of some of the correlates of the decision to exercise or not to exercise. Exercise was chosen as the health behavior to be studied for several reasons. The value of exercise to the promotion and maintenance of health is generally acknowledged, but the practice of exercise varies widely. Like most behaviors which impact on health status, exercise must be carried out repetitively over a continuing period of time if it is to be beneficial. The intent to exercise and self-reported exercise behavior over a period of one month, studied in this investigation, represent the modification of lifestyle required for the practice of exercise. The conceptual framework utilized was the behavioral intent model. This subjective expected utility model was chosen because it has considerable empirical support, especially in the area of consumer behavior. Unlike some other models used to explain health behavior, the behavioral intent model does not assume that health-related behavior is motivated by health-related concerns. Rather, it posits that the intent to perform a behavior is determined by beliefs about the consequences of the behavior and perceptions of the wishes of significant others. In this study, the modal salient beliefs and referents concerning exercise for a randomly selected sample of university

faculty and staff were identified. The stability of these beliefs and referents over time was assessed. The relative contribution of the attitudinal and normative components to the intent to exercise was determined, and a significant relationship between intent to exercise and exercise behavior was demonstrated. The beliefs of exercise intenders and exercise non-intenders were examined for significant differences between the two groups. The rate and distribution of self-reported exercise behavior was assessed. Finally, personal and demographic variables were studied and the effect of these variables on the intent to exercise was determined.

#### Summary

The process through which this research was accomplished involved a sequence of steps. Following selection of two regional Oklahoma universities as sites for the study, 20 faculty and staff from each institution were contacted and asked to list those consequences most likely to follow from spending at least 20 minutes a day, four days per week during the next month in one or more specified forms of exercise. These 40 subjects were also asked to designate referents who would care whether or not the subject exercised. The 16 consequences and four referents mentioned most frequently and earliest in the interview, were considered to be the modal salient consequences and referents. These consequences and referents formed the basis for a questionnaire designed to measure attitudes and normative beliefs concerning exercise. The questionnaire included a seven-point "good-bad" evaluative semantic

differential scale for each item concerning the consequences of exercise. A seven-point "likely-unlikely" scale accompanied each referent item, assessing the motivation to comply with the perceived wishes of these referents. The behavioral intent to exercise was assessed, as were personal and demographic data. Finally, a summary statement of attitudes toward exercise, as it was defined in the study, and of normative beliefs was included. This questionnaire was submitted to a panel of five judges who evaluated its clarity and format. Subsequently, the questionnaire was administered to 31 randomly selected faculty and staff from one of the regional universities. The same questionnaire was readministered to these subjects one month later, generating the test-retest data by which the stability of the attitudinal and normative components of the model were evaluated.

The relative stability of the attitudes and normative beliefs concerning exercise was clearly established. The questionnaire was slightly revised, adding three consequences of exercise items often reported in the literature and mentioned by the subjects who took part in the test-retest procedure. The questionnaire was then printed, and sent to the 200 faculty and staff who had been selected as subjects for the study. Questionnaires were returned by 160 of these subjects. Twenty-five questionnaires had to be deleted from the sample because the respondents did not meet the age requirements or because the questionnaires were incomplete. The remaining 135 respondents furnished the information used in most of the ensuing data analyses. Utilizing

this data, the relative contribution of the attitudinal and normative variables to the intent to exercise were identified. It was determined that exercise intenders could be distinguished from non-intenders on the basis of specific beliefs about the consequences of exercise and their evaluation of these consequences. One month after the return of the questionnaire, attempts were made to contact the respondents by telephone. When contacted, the respondent was asked the extent to which he/she had exercised, as defined in the questionnaire, during the preceding month. It proved to be impossible to contact 14 of the subjects. The self-reported exercise behavior of the 121 subjects who were contacted provided information on the relationship between intent to exercise and behavior. The rate, distribution, and kinds of exercise performed were also assessed. Finally, personal and demographic variables were examined for their contribution to the intent to exercise. It was found that the claim of the behavioral intent model to sufficiency was supported by the data.

### Discussion of Findings

#### Beliefs about Exercise

This investigation clearly demonstrates the applicability of the behavioral intent model to studies of preventive health behavior. The elicitation technique yielded consequences of exercise on the basis of which intenders and non-intenders were very effectively distinguished. Seven of the 18 consequences on which the two groups differed received highly polarized probability estimates, one of the criteria suggested

by Fishbein (1975) for establishing salience. Six of these consequences were positive, centering on feeling better physically and feeling better about oneself. This finding supports those of Hochbaum (1979), Martin (1980), and others that health-related behaviors often are motivated by desires to feel and look better, rather than by threat-reducing concerns. For this sample, at least, preventive health behavior was effectively studied by use of a value-expectancy framework which was not based on threat.

#### Referents for Exercise

The paucity of significant referents for exercise is somewhat surprising in view of Pender's (1979) study of preventive health behaviors. In that investigation, exercise was found to be strongly related to normative beliefs. It may be that the present sample of relatively well educated subjects is more likely to make decisions about exercise based on anticipated outcomes and less likely to be sensitive to the wishes of others. There was some tendency to view "boss or co-workers" as wishing the subject not to exercise. This may be an artifact in scoring in which subjects who were convinced that their boss or co-workers had no interest in their exercise behavior responded to this item with a "zero." In any event, it appears that only the spouse or housemate are perceived as concerned that the subject exercise. Except for the boss or co-worker, the motivation to comply with all referents was approximately zero. The slight negative trend in the motivation to comply with boss or co-worker may represent a desire on

the part of the respondents to appear independent and autonomous in their decisions about exercise. Saltzer (1981) noted a similar phenomenon in her application of the behavioral intent model to weight loss.

### Stability of Attitudes and Normative Beliefs

With one exception, the components of the model were found to be quite stable over time. A subcomponent of the variable of subjective norms, "motivation to comply" was very unstable in the test-retest procedure. This instability of the "motivation to comply" variable is not readily explained. It may be due to idiosyncratic interpretations of the "motivation to comply" items which vary within the same individual over time. Alternatively, it may be that the individual's desire to comply changes, possibly influenced by such intercurrent events as an argument with a referent. Fishbein and Ajzen (1975) have described this component as the least understood term in the model. Additional empirical work directed toward the clarification of the "motivation to comply" variable should be undertaken.

Perhaps because of its instability, the "motivation to comply" variable added nothing to the predictive power of the model. The correlation of the subjective norms variable with its subcomponents rose dramatically when "motivation to comply" was excluded from the calculations. This lack of robustness of "motivation to comply" has been found in other studies (Ryan and Bonfield, 1975; Schlegel et al, 1977). An assessment of the subject's motivation to comply with the wishes of

significant others regarding an action is intuitively appealing. What appears to be lacking is a valid and reliable tool to measure this variable.

#### Contribution of Attitudinal and Normative Variables to Intent

The behavioral intent model posits that the intent to carry out or not to carry out a given behavior is based upon attitudes toward the action and subjective norms regarding the wishes of significant others with respect to the action. In the present investigation, only the attitudinal component was found to significantly affect intent. For this sample, the normative component of the model contributed nothing to the explained variance in intent.

This nonsignificance of the normative variable has been noted in other studies of the behavioral intent framework. In a series of four hypothetical situations presented to a sample of college students, Ajzen and Fishbein (1972) found that normative influences were significant in only one. Harrell and Bennett (1974) found that normative beliefs were unimportant in the prediction of intent relating to physician's prescribing behavior. In a study of contraceptive usage intentions, McCarty (1981) similarly discovered that the normative component of the model was problematic. It may be that normative beliefs without an effective measure of the motivation to comply are themselves so dependent on attitudinal concerns that the variable conveys no new information regarding intent. Certainly, the correlation of .51 between the summary statements of attitude (A act) and

subjective norms (SN) found in this investigation calls into question the assumed independence of these two components of the model. McCarty (1981) noted that normative beliefs often affect intention through attitude as well as having an independent effect upon intention. Emphasis in the model, however, is placed on the unique contribution of each component to the prediction of intent. The component with the greater relative influence is held to be the more important determinant of intent. In their study of intent to have an abortion or continue a pregnancy, Smetana and Adler (1980) also commented on the effect exerted by the normative component upon attitude. In this investigation, attitude appeared to be a function both of beliefs about consequences and of normative beliefs. They comment that additional theoretical and empirical work in this area is needed. At this time, it can only be said that subjective norms and attitude toward the act appear to be part of a generalized perception of exercise.

#### Intent to Exercise and Behavior

Despite the nonsignificance of its normative variable, the behavioral intent model captured much of the variability in intent to exercise and in exercise behavior. The multiple correlation of .77 between intent and the model's components is well above the average multiple correlation of .62 reported by Ryan and Bonfield (1975) for a series of field tests of consumer behavior. For the same series of studies, the mean correlation between intent and behavior was .435 (Ryan and Bonfield, 1975). In the present investigation, intent

correlated .65 with self-reported exercise behavior one month later. This figure is especially impressive in light of the month-long interval between the measure of intent and that of behavior. Jaccard (1975) points out that the longer the lapse of time between the measure of intent and that of behavior, the more likely it is that intervening events or new information will act to change the intent and reduce its correlation with behavior. Most often, behavior, as it has been studied in applications of the behavioral intent model, has been a single act: voting, giving blood, attending a clinic, or making a purchase. In this study, the behavioral criterion called for repeated and sustained action over the period of a month. In two recent studies correlating intent with behavior sustained for a month or six weeks, the intent-behavior correlations have been reported as .47 (Schlegel et al, 1977) and .44 (Saltzer, 1981). The correlation of .65 between intent and exercise behavior found in the present investigation indicates that the behavioral intent model is applicable to preventive health behavior. Many preventive health behaviors require alterations in lifestyle and activities carried out repetitively over time. The demonstrated ability of the model to identify, on the basis of their attitudes, those who are likely to carry out such activities suggests that the model has significant utility in studies of health behavior.

### Attitudes as a Basis for Distinguishing Intenders and Non-Intenders

Those respondents who intended to exercise were clearly distinguished from those who did not on the basis of their beliefs about the consequences of exercise and their evaluations of these consequences. The two groups differed significantly on all but one of the 19 Bi ei items. Question 22, concerned with the effect of exercise upon the availability of time for relaxation, elicited similar responses from exercise intenders and non-exercise intenders. The lower limit of the simultaneous confidence interval for items 7 and 8 was very close to zero. These items, dealing with the likelihood that exercise would necessitate a more structured day (#7) and the effect of exercise on weight (#8) may contribute little to the explanation of differences between the two groups. It is interesting to note that two of these items (#7 and #22) deal with the effect of exercising on available time. It may be that time is not a constraint for this sample. The fact that the variable of free or leisure time was not significantly correlated with intent or behavior supports this observation. Question 8, concerned with weight loss, also appears to be relatively unimportant. It may be that obesity or weight control are not pressing issues for this sample, or that exercise is not believed to contribute to weight loss.

The tabled means of belief scores and evaluation of belief scores for intenders and non-intenders revealed that both groups tended to agree on the sign, negative or positive, to be placed on the likelihood of the consequences. In the three instances of disagreement, the

consequences, all of which were negatively evaluated, were seen by the intenders as being less likely. There was very substantial agreement among intenders and non-intenders as to the relative "goodness" or "badness" or degree of importance to be attached to the consequences. In each case, the evaluation was consistent with what would intuitively be expected. However, the two groups disagreed on the relative likelihood of the consequences. It appears that people who intend to exercise perceive the benefits of such activity as more likely to occur than do those who do not. For example, exercise intenders believed that regular exercise was very likely to result in having more energy, in feeling good about themselves, and in feeling better generally. These outcomes were seen as much less likely by the non-intenders. Conversely, non-intenders believed that they were more likely to experience injury to muscles or joints or to have a health condition aggravated as a result of exercise.

#### Self-Reported Exercise Behavior

It is interesting to note that brisk walking was the form of exercise most commonly reported. This finding is in accordance with that of Harris (1979) in which walking was said to be the form of exercise chosen by more Americans than any other. The reasons given for not exercising included health concerns, time, constraints, and the belief that enough exercise was obtained through daily activities. This also is in accord with the Harris (1979) study in which lack of time and poor health were the most common barriers to exercise. The idea that

such activities as gardening and yard work provide sufficient exercise is worthy of comment. In some cases, during the spring and summer months, such activities may indeed be strenuous. However, these activities are sporadic and often do not increase cardiovascular fitness. Persons depending on gardening or yard work for exercise must perform them regularly and find another form of activity during the fall and winter.

#### Demographic Variables Associated with Exercise

The only variable external to the model which was found to correlate significantly with intent was the exercise behavior of the spouse. For the 103 married respondents, the correlation between intent to exercise and whether or not the spouse exercised regularly was .35. Those subjects whose spouse did exercise were more likely to intend to do so themselves. This is consistent with the observation that spouse or housemate served as a salient referent for exercise. It is also in agreement with Mackie's (1975) study which found that having a spouse who exercises creates more positive perceptions of exercise. Living in the same household with a person who exercises regularly provides first-hand evidence of the benefits of exercise. In addition, such family functions as meals may be scheduled so as to allow time for exercise. This association between intent to exercise and the spouse's exercise behavior indicates that both members of a household pair should be encouraged to exercise.

### The Claim of the Model to Sufficiency

The observation that neither the age nor the sex of the respondents was related to exercise behavior is significant. This finding may reflect the recent emphasis placed on the need of all population groups for exercise. The paucity of significant associations between intent and variables external to the model may be interpreted as giving support to the model. The behavioral intent model posits that the attitudinal and/or normative components alone will influence intent. This is the finding of the present study. The one external variable which was significantly associated with intent, exercise behavior of the spouse, became insignificant when the component of attitude toward the act was held constant. Thus, the claim of the model to sufficiency is supported.

### Conclusions and Implications

In this investigation, the relationships between the predictor variables of attitudes toward exercise and normative beliefs and the criterion variables of exercise intent and exercise behavior were explored. It was found that intent to exercise or not to exercise was strongly related to self-reported exercise behavior one month later. Exercise intenders could be distinguished from exercise non-intenders on the basis of their attitudes toward exercise. These attitudes were highly correlated with the perceived likelihood of various consequences of exercise and the evaluation of these consequences. The investigation revealed that intenders and non-intenders agreed on the sign, negative

or positive, to be attached to the evaluation of the consequences. They tended to disagree on the relative probabilities of the consequences. Intenders perceived the positive consequences as being more likely than did non-intenders. In contrast, non-intenders were more likely to attach high probabilities to negative outcomes of exercise such as injury to muscles or joints or having a health condition aggravated.

These findings have implications for the health professional who wishes to promote the practice of exercise. Using the Attitudes Toward Exercise instrument, it should be possible to identify those persons who are at risk of obtaining inadequate exercise and to pinpoint the negative perceptions associated with the decision not to exercise. These perceptions may center on the fear of injury to muscles or joints or concern that exercise will aggravate a health condition. For some individuals, these concerns may be valid. However, a form of exercise usually can be recommended in which the likelihood of negative outcomes is reduced while benefits of physical activity are realized. For example, swimming and brisk walking have a low potential for causing injury to muscles and joints. Similarly, aerobic dancing, which can be done within the home, puts little stress on ligaments and bones.

The fear of aggravating a health condition through exercise fails to recognize that most of the health conditions commonly found in adults are benefited by appropriate exercise. Exercise is often an important part of the therapeutic regimen for diabetes mellitus, osteoarthritis, and heart disease. The health professional working with

such conditions should encourage them to adhere to a carefully designed program of physical activity.

Those persons who find lack of time to be a significant barrier to exercise may be encouraged to try jumping rope. This aerobic activity requires less expenditure of time than do walking or jogging and realizes most of the cardiovascular benefits. Tailoring the exercise program to the needs and concerns of the clients may help to increase their level of activity.

Walking was the most commonly reported form of exercise in this study. Walking can be done by persons of either sex and almost any age. It requires no equipment other than a pair of good, supportive shoes. Walking does not require access to a facility such as a gymnasium or court. It can be carried out under most weather conditions and, if the walk is brisk and sufficiently long, walking is a beneficial form of exercise. Walking can be done with a companion. Health professionals wishing to encourage exercise among their older clients should present the advantages of a carefully designed walking program.

Six of the seven most highly polarized (and perhaps more salient) outcomes of exercise focused on feeling better about oneself or feeling better physically. No conclusions regarding a cause and effect relationship can be drawn on the basis of this study. Nevertheless, health professionals wishing to promote the practice of exercise should emphasize the likelihood of positive outcomes from exercise programs. In particular, consequences relating to feeling good, mentally and physically, should be highlighted.

The one variable external to the model which was found to be significantly correlated with intent to exercise was the exercise habits of the spouse. Those persons whose spouse exercised were more likely to intend to do so themselves. Spouse was the only referent elicited which appeared to be salient. These findings suggest that exercise programs involving both husband and wife may be more successful than programs aimed at only one member of the household. Where husband and wife both exercise, they can provide mutual support to one another, and positive examples of the benefits to be realized through regular physical activity. In addition, household routines may be more easily modified to accommodate the exercising pair.

#### Recommendations for Further Study

Because of the ex post facto nature of the measures of attitudes and intent, no conclusions can be drawn about the causal relationships of these variables. Nonetheless, the behavioral intent model suggests that intention may change as a result of change in the attitudinal or normative components. In this investigation, the attitudinal component was found to be strongly related to intent to exercise. It follows that changes effected in the attitudinal component may lead to changes in intent to exercise and subsequently to changes in exercise behavior. A potentially fruitful approach to attitude change has been pointed out by Kahneman and Tversky (1982) in their discussion of the psychology of preference. These authors state that framing effects or the way people define the consequences of their choices are very important in

determining what choices are made. Reversal of preference may be induced by altering the description of outcomes.

There is precedent in the literature for such attempts to induce changes in intention through attitude change strategies. Lutz (1975) attempted to alter consumers' perceptions of the attributes (consequences) of using a particular brand and the values (evaluations) attached to these attributes. He found that consumerstranslated objective information on brands into subjective perceptions in a systematic way. Perceptions were not dominated by individual differences. Moreover, changes in beliefs about consequences did result in changes in attitude and intention to purchase a given brand.

McCarty (1981) applied change strategies to attitudes and normative beliefs concerning contraceptive usage. He found that changes in attitudes were followed by the expected changes in intention regarding use of contraceptives.

These studies provide support for the model's position that intention to perform an action may be modified through changes in attitudes toward the action. It remains to be determined if attitudes toward exercise may be altered, leading to changes in intention, and to see if such changes in intention subsequently give rise to behavior change. Certainly, such experimental or quasi-experimental studies are needed in the area of preventive health behavior.

Another area of future research should be the role played by two variables external to the model in the formation of intent. These two

variables are the hierarchical value placed on the outcomes of exercise and locus of control. Rokeach (1973) notes that differences among individuals in terms of choices for action may lie in the hierarchy of values attached to the outcomes of these actions. The behavioral intent model does not include a term for measuring the relative importance or value attached to a given outcome. The research done in this area has produced conflicting results. Nonetheless, it would be worthwhile to develop a common direction of preference. The present investigation revealed that exercise has many such outcomes. A related variable which may affect behavioral intention is Rotter's (1966) formulation of locus of control. Locus of control beliefs have been widely researched in relation to health behaviors (Wallston and Wallston, 1978). It has been found that internality is generally associated with the achievement of positive health behaviors. Research in which data are gathered on the relative internality or externality of the respondents and on the values placed by these respondents on the outcomes of exercise may improve the predictive power of the model. The interactive effects of locus of control and the relative weights of the normative and attitudinal components of the behavioral intent model also would be of interest.

The present investigation studied attitudes, normative beliefs, intentions, and behavior relative to exercise among a sample of university faculty and staff. It cannot be assumed that the results of the study are generalizable to other groups. Exercise attitudes, normative

beliefs, intentions and behavior should be studied for other groups. The results for the two or more groups could be compared using pattern recognition.

The technique of pattern recognition has great potential applicability to studies of preventive health behavior. Pattern recognition methods can be used to find useful relationships among samples upon which multiple measurements have been made (Kowalski, 1980). In the present investigation, 19 measurements were gathered on a sample, representing the 19 beliefs and evaluations of beliefs regarding outcomes of exercise. It would be very useful to replicate this study with another sample, again gathering data on the 19 dimensions of beliefs and evaluations of beliefs. Multivariate statistical methods would provide an objective means to compare the two groups. However, the addition to statistical comparisons of pattern recognition techniques would provide information more easily assimilated by the human mind (Yeung, 1980). Essentially, the similarities and differences among the samples would be compared along the dimensions of beliefs and evaluation of beliefs. Data would be represented as labeled points in an n-dimensional space, reduced to two dimensions. Although this technique does result in some loss of information, the resultant clusters and patterns permit easy recognition of relationships. It may be that key differences between intenders and non-intenders in terms of beliefs about the consequences of exercise and evaluations of these consequences would be revealed by pattern recognition. This technique

then might be used to identify segments of groups who were at high risk of obtaining inadequate exercise or who shared commonalities in perceptions of exercise. Appropriate strategies to maintain or alter these perceptions then could be instituted.

## APPENDIX A

## PANEL OF JUDGES

Dr. Judy Alexander  
Department of Sociology  
East Central Oklahoma State University  
Ada, Oklahoma

Dr. Shirley Gordon  
Division of Nursing  
East Central Oklahoma State University  
Ada, Oklahoma

Dr. David Marshall  
Department of Math and Physics  
Texas Woman's University  
Denton, Texas

Dr. Bettye Myers  
Department of Physical Education and Recreation  
Texas Woman's University  
Denton, Texas

Dr. Elaine Roubik  
Division of Nursing  
Southwestern Oklahoma State University  
Weatherford, Oklahoma

## APPENDIX B

## RATING SHEET

## DIRECTIONS:

CLEAR \_\_\_\_\_

UNCLEAR \_\_\_\_\_

EXAMPLES HELPFUL \_\_\_\_\_

EXAMPLES NOT HELPFUL \_\_\_\_\_

## SUGGESTIONS:

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## WORDING OF QUESTIONS:

QUESTION 1      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

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QUESTION 2      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

---

QUESTION 3      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

---

QUESTION 4      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

---

QUESTION 5      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

QUESTION 6	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 7	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 8	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 9	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 10	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 11	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 12	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 13	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	

QUESTION 14	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 15	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 16	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 17	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 18	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 19	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 20	CLEAR _____	UNCLEAR _____
	SUGGESTIONS: _____	
	_____	
QUESTION 21	CLEAR _____	UNCLEAR _____
	SUGGESTIONS _____	
	_____	

QUESTION 22      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 23      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 24      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 25      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 26      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 27      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 28      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 29      CLEAR \_\_\_\_\_      UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

QUESTION 30

CLEAR \_\_\_\_\_

UNCLEAR \_\_\_\_\_

SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

OTHER COMMENTS OR SUGGESTIONS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

## APPENDIX C

CRITERIA FOR THE SELECTION OF  
CONSEQUENCES AND REFERENTS

Consequences

1. Each consequence utilized in the final questionnaire must have been mentioned by at least five subjects, or
2. Must be conceptually related to one of the referents mentioned first by ten or more subjects.
3. Each consequence must have been mentioned first or second by at least two subjects.
4. Each consequence must be potentially applicable to all subjects and to any of the specific types of exercise identified in the investigation.

Referents

1. Each referent utilized in the final questionnaire must have been mentioned by at least five subjects.
2. Each referent must have been mentioned first or second by at least two subjects.

## APPENDIX D

## FORM FOR ELICITATION OF CONSEQUENCES AND REFERENTS

HELLO \_\_\_\_\_, MY NAME IS ELIZABETH SCHMELLING AND I AM A FACULTY MEMBER OF THE DEPARTMENT OF NURSING AT EAST CENTRAL UNIVERSITY. I ALSO AM A DOCTORAL STUDENT AT THE TEXAS WOMAN'S UNIVERSITY. AS A PART OF MY PROGRAM, I AM CONDUCTING A STUDY ON PHYSICAL EXERCISE. YOUR NAME HAS BEEN CHOSEN AT RANDOM FROM A LIST OF FACULTY AND STAFF HERE AT (EAST CENTRAL/SOUTH-WESTERN). I WOULD LIKE TO ASK YOU A FEW QUESTIONS ABOUT WHAT YOU SEE AS THE CONSEQUENCES OR RESULTS OF EXERCISE. I WILL NOT BE ASKING YOU ABOUT YOUR PERSONAL HABITS; JUST ABOUT THE ADVANTAGES AND THE DISADVANTAGES OF EXERCISE. WILL YOU TAKE JUST A FEW MINUTES TO ANSWER THESE QUESTIONS? THANK YOU.

Question 1: What do you see as the positive and negative consequences of obtaining regular physical exercise--by this I mean spending the equivalent of at least 20 minutes a day, 4 times a week, on running, jogging, brisk walking, swimming, cycling, jumping rope, or calisthenics, during the next month?

(Responses)

_____ feel better in general	_____ look better
_____ stay healthy	_____ live longer
_____ lose weight	_____ reduce chance of heart attack
_____ strengthen muscles	_____ take up too much time
_____ strengthen heart and lungs	_____ cause fatigue
_____ increase endurance or stamina	_____ cause sweating
_____ reduce tension	_____ cause muscle strain
_____ sleep better	_____ cause boredom
(Other)	_____ aggravate health condition

Question 2: Please describe any other advantages or disadvantages of this sort of exercise.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Question 3: Is there anything else you associate with exercise of this type?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Question 4: Is there anyone you know who might like or dislike you to exercise in this way during the next month?

_____ husband or wife	_____ doctor
_____ children	_____ friends
_____ parents	_____ boss or co-workers
_____	_____
_____	_____
_____	_____

THANK YOU VERY MUCH. NOW I WOULD LIKE TO ASK YOU A FEW QUESTIONS ABOUT YOURSELF SO THAT I CAN GET A BETTER IDEA OF WHAT THE PEOPLE WHO CONTRIBUTED TO THE QUESTIONNAIRE ARE LIKE. PLEASE TELL ME:

<u>Age Range</u>	<u>Sex</u>	<u>Marital Status</u>
_____ 30-34	_____ Male	_____ Single
_____ 35-39	_____ Female	_____ Married
_____ 40-44		_____ Widowed
_____ 45-50		_____ Separated or Divorced
_____ 51-55		

If married, does your spouse exercise regularly? \_\_\_\_\_ Yes \_\_\_\_\_ No

Last year completed in school

_____ Highschool Graduate	_____ Master's Degree
_____ Some College Work	_____ Doctorate
_____ Baccalaureate Degree	

Occupation \_\_\_\_\_

If faculty member, area in which you teach: \_\_\_\_\_

Approximately how many hours of free or leisure time are available to you each day?

_____ None	_____ Two to three hours
_____ A little less than one hour	_____ More than three hours
_____ One to two hours	

THANK YOU VERY MUCH FOR YOUR TIME. ALL OF YOUR ANSWERS WILL BE KEPT COMPLETELY CONFIDENTIAL. WOULD YOU LIKE TO ASK ME ANY QUESTIONS ABOUT THE STUDY?

## APPENDIX E

CONSEQUENCES AND REFERENTS PERTAINING  
TO PHYSICAL EXERCISE AS ELICITED FROM  
A RANDOM SAMPLE OF FORTY SUBJECTS

VALENCE	CONSEQUENCE	TIMES MENTIONED
+	LOSE WEIGHT	17
+	FEEL BETTER IN GENERAL (16) increased feeling of well-being (1)	17
+	STRENGTHEN HEART AND LUNGS	16
+	STRENGTHEN MUSCLES (11) increase muscle tone (2)	13
-	TAKE UP TOO MUCH TIME	14
-	TAKE TIME AWAY FROM OTHER IMPORTANT ACTIVITIES	related to "time"
+	INCREASE ENERGY AND/OR STAMINA (5) have more energy (6)	11
+	PROMOTE RELAXATION, FEEL LESS TENSE (5) relax better after exercise (3) feel less tense (3)	11
+	LOOK BETTER, IMPROVED APPEARANCE (8) better complexion (1) stay thin, good figure (1)	10
+	STAY HEALTHY, RESIST COLDS	9
+	INCREASES MENTAL ALERTNESS (8) gives me time to think (1)	9
-	AGGRAVATE A HEALTH CONDITION	9
-	CAUSE MUSCLE ACHES OR FATIGUE	9
+	FEEL GOOD ABOUT MYSELF increased self worth (4) good attitude about myself (2) feeling of being self-disciplined (2)	8
-	LOCKED INTO A ROUTINE cause boredom (5) locked into a routine or schedule (2)	7
-	CAUSE INJURY TO MUSCLES OR JOINTS	5

REFERENT	TIMES MENTIONED
HUSBAND OR WIFE	20
CHILDREN/SIBLINGS	11
FRIENDS	5
BOSS OR CO-WORKERS	5

N.B. Eleven persons said that there was no one who would like them to exercise or refrain from exercising. Three people identified the physician as a referent.

I have included "house-mate" to accommodate those persons who share a home with someone other than a spouse. I have included children and siblings in "other family members."

## APPENDIX F

November 7, 1981

Dear Faculty or Staff Member:

I am a faculty member in the Division of Nursing here at East Central University, and am a doctoral student at Texas Woman's University. As a part of my doctoral work, I am developing a questionnaire to study some of the factors associated with the practice of physical exercise. This study will form the basis for my dissertation.

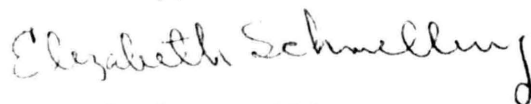
Your name was selected at random from a list of faculty and staff at the University. I hope that you will assist me in the development of the questionnaire by completing the attached document and returning it to me in the accompanying envelope. Within a few weeks I will ask you to fill out a second, comparable, questionnaire. You will notice that each questionnaire is numbered. This number will be used to identify your questionnaire and on all data analysis. The confidentiality of your responses will be preserved at all times.

In order that your rights be protected, it is important that you read the following:

1. I understand that no medical service or compensation is provided to the subjects by Texas Woman's University as a result of injury from participation in research.
2. I understand that my participation in this investigation is voluntary and that I may discontinue my participation at any time.
3. I UNDERSTAND THAT MY RETURN OF THIS QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

If you would like to receive a report of the results of the study, please check the box at the end of the questionnaire. I will be happy to answer any questions which you may have concerning the project. I may be reached at extension 429 or at 332-1064 (home). Thank you very much for your help.

Sincerely,



Elizabeth Schmelling



EAST CENTRAL UNIVERSITY

ADA, OKLAHOMA 74820

Department of Nursing

April 26, 1982

Dear Faculty or Staff Member:

I am a faculty member in the Division of Nursing at East Central Oklahoma State University, and am a doctoral student at Texas Woman's University. As a nurse, I am interested in health-related behavior. I am studying some of the factors associated with the decision to exercise or not to exercise. This study will form the basis for my dissertation.

Your name was drawn at random from a list of faculty and staff provided me by the University, and I hope that you will be willing to participate in this study. Within a few days you will receive a questionnaire asking about your thoughts and feelings related to exercise. It does not matter whether or not you exercise. I am very interested in hearing from persons who exercise and from those who do not. The questionnaire will take only 15-20 minutes to complete. Included with the questionnaire will be a stamped, self-addressed return envelope.

I hope that you will complete and return the questionnaire, as your assistance in this study will be greatly appreciated. I will be happy to send you a copy of the results of the study if you wish. If you have any questions concerning the study, please call me at 332-8000 ext 429 (office) or 332-1064 (home). Thank you for your consideration of this request.

Sincerely,

*Elizabeth Schmelling*

Elizabeth Schmelling, R.N., M.S.



EAST CENTRAL UNIVERSITY

ADA, OKLAHOMA 74820

May 5, 1982

Dear Faculty or Staff Member:

A few days ago you should have received a letter asking for your assistance and participation in a study of attitudes towards exercise. The purpose of this study, which will be the basis for my doctoral dissertation, is to explore feelings and beliefs about exercise. In order to get a wide range of opinions, it is very important that both people who do not exercise and those who do exercise participate in the study.

I hope that you will assist me by filling out the enclosed questionnaire. It will take no more than 15 to 20 minutes to complete. A stamped, return envelope is enclosed for your convenience.

You will notice that each questionnaire is numbered. This number will be used on all data analysis. I will be in touch with you briefly by telephone a short time after you have returned the questionnaire. This is the only time your name will be used in the study so that confidentiality is assured.

In order that your rights be protected, it is important that you read the following:

1. I understand that no medical service or compensation is provided to the subjects by Texas Woman's University as a result of injury from participation in research.
2. I understand that my participation in this investigation is voluntary and that I may discontinue my participation at any time.
3. I UNDERSTAND THAT MY RETURN OF THIS QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

If you would like to receive a report of the results of the study, please check the box at the end of the questionnaire. I will be happy to answer any questions which you may have concerning the project. I may be reached at 332-1064 (home) or 332-8000 ext. 429 (business). Thank you very much for your assistance.

Sincerely,

Elizabeth Schmelling, R.N., M.S.

May 13, 1982

Dear Faculty or Staff Member,

Some days ago I mailed you a questionnaire concerning attitudes towards exercise. I have not yet received your response and wonder if it has been lost in the mail. If so, I will be happy to send you another copy. If you have the questionnaire, I would very much appreciate your returning it as soon as possible. The responses of each person are very important. Please contact me at 332-8000, ext 429 if you have any questions about the survey, or if you wish me to send you another questionnaire.

If you have already returned the questionnaire, please disregard this card. Thank you very much for your participation and assistance.

Sincerely,

Elizabeth Schmelling



EAST CENTRAL UNIVERSITY

ADA, OKLAHOMA 74820

Department of Nursing

May 20, 1982

Dear Faculty or Staff Member:.

A few weeks ago, I mailed to you a questionnaire asking about your thoughts and beliefs concerning exercise. I have not yet received your response. Because the opinions and attitudes of each person are important, and knowing how easily material can be lost in the mail, I am enclosing a second copy of the questionnaire. A stamped, self-addressed return envelope is also enclosed. I hope that you will take a few minutes to complete the questionnaire. All questionnaires are numbered and, except for one telephone contact with me a little later on, your name will not be used in any way.

In order that your rights be protected, it is important that you read the following:

1. I understand that no medical service or compensation is provided to subjects by Texas Woman's University as a result of injury from participation in research.
2. I understand that my participation in this investigation is voluntary and that I may discontinue my participation at any time.
3. I UNDERSTAND THAT MY RETURN OF THIS QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

I very much appreciate your participation and assistance in this study. If you have any questions about the project, please call me at 332-8000, Ext. 429 (business) or 332-1064 (home). If you have already returned your questionnaire, please disregard this letter. Thank you again; I look forward to receiving your response.

Sincerely,

A handwritten signature in cursive script that reads "Elizabeth Schmelling".

Elizabeth Schmelling, R.N., M.S.

ES/cm

Enclosure

## APPENDIX G

DIRECTIONS FOR SELF-ADMINISTRATION OF  
QUESTIONNAIRE

The purpose of this questionnaire is to determine how you feel and what you believe about physical exercise. It may be that you never exercise, or you may exercise on a regular basis. For the purpose of this study, it does not matter. Your feelings and beliefs about exercise are very important--whether you actually do exercise is of no consequence.

There are two kinds of questions in this questionnaire. In one kind of question, you are asked to estimate the "chances in 10" of an event taking place. For example:

The chances are \_\_\_\_\_ in 10 that I will eat breakfast on the average of at least 4 times a week during the next month.

To respond to this question, make a rough estimate of the likelihood that you will eat breakfast as specified in the question. If you almost always eat breakfast, you would estimate your chances as 10 in 10, or perhaps 9 in 10. If you almost never eat breakfast, the chances would be 0 in 10 or perhaps 1 in 10. If you estimate that there is a fifty-fifty chance that you will eat breakfast at least 4 or 5 times a week during the next month, your answer would be 5 in 10, and so on. Please remember that:

1. Your answer must range from "0 in 10" to "10 in 10."
2. You should put down your best estimate; there are no right or wrong answers.

The other kind of question uses a pair or pairs of words to express your feelings about an event. For example, the following question would express your feelings about eating breakfast:

For me, eating breakfast on the average of at least  
4 times a week is:

Good /     /     /     /     /     /     /     / Bad

If you felt that, for you, eating breakfast was very good, you would place an "X" mark in the space nearest the word "Good." If you felt that eating breakfast was neither good nor bad, you would place an "X" mark in the middle portion of the scale, and if you felt that, for you, eating breakfast was bad, you would place an "X" near the "Bad" end of the scale. At times, the words "Good" and "Bad" may not seem appropriate. For example:

For me, getting a raise in pay is:

Good /     /     /     /     /     /     /     / Bad

In this case, place the "X" mark on the scale position which shows how important or motivating getting a raise in pay would be for you. If a raise would be very good or important, place the "X" near the "Good" end of the scale, while if getting a raise would be very unimportant or non-motivating to you, place the mark near the "Bad" end of the scale. Some questions will have more than one pair of words beneath it. For example:

For me, eating breakfast is: (mark each scale.)

Good /     /     /     /     /     /     /     / Bad

Not Enjoyable /     /     /     /     /     /     /     / Enjoyable

Please remember to:

1. Place the "X" mark in the middle of the space, as shown above, not on the divider lines.
2. Never put more than one "X" mark on a single line.
3. Mark each scale if there is more than one pair of words following the question.

The questionnaire will take no more than 10 to 15 minutes to complete. Please do answer all questions; the confidentiality of your responses will be maintained. If you wish to receive a copy of the results of this study, check the box at the end of the questionnaire. Thank you very much for your time and assistance.

## QUESTIONNAIRE

1. The chances are \_\_\_\_\_ in 10 that I will spend on the average of at least 20 minutes a day, four days a week, in running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics during the next month.
2. Most people who are important to me think that I should spend on the average at least 20 minutes a day, four days a week during the next month in running, swimming, jumping rope, cycling, brisk walking, jogging, or calisthenics. (Mark each scale.)

False / / / / / / / True  
Likely / / / / / / / Unlikely  
Probable / / / / / / / Improbable  
Agree / / / / / / / Disagree

3. Devoting at least 20 minutes a day, four days a week during this next month to running, swimming, cycling, jumping rope, brisk walking, jogging or calisthenics would be, for me: (Mark each scale.)

Good	/ / / / / / / / /	Bad
Worthless	/ / / / / / / / /	Valuable
Boring	/ / / / / / / / /	Interesting
Easy	/ / / / / / / / /	Difficult
Convenient	/ / / / / / / / /	Inconvenient
Enjoyable	/ / / / / / / / /	Not Enjoyable
Possible	/ / / / / / / / /	Impossible
Worth It	/ / / / / / / / /	Not Worth It
Necessary	/ / / / / / / / /	Unnecessary

4. The chances are \_\_\_\_\_ in 10 that I have a generally favorable attitude towards my spending, on the average, at least 20 minutes a day, four days a week during the next month in running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics.

5. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would give me more energy and stamina.

For me, having more energy and stamina is:

Good / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Bad

6. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me feel good about myself.

For me, feeling good about myself is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

7. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would mean my day had to be more highly structured.

For me, a more structured day is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

3

8. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me lose weight.

For me, losing weight is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

9. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause injury to some muscles or joints.

For me, injury to muscles or joints is:

Good / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Bad

10. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause me to feel better in general.

For me, feeling better in general is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

11. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would take up valuable time.

For me, having time taken up with exercise is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

4

12. The chances are \_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would strengthen my muscles.

For me, increased muscle strength is

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

13. The chances are \_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would make me more mentally alert.

For me, being more alert mentally is:

Good / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Bad

14. The chances are \_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would aggravate a health condition which I may have.

For me, having a health condition aggravated is:

Good / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Bad

15. The chances are \_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me stay healthy and resist colds.

For me, staying healthy and resisting colds is:

Good / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Bad

16. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would strengthen my heart and lungs.

For me, strengthening my heart and lungs is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

17. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would take time away from other activities.

For me, using time which I could spend on other activities is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

18. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me feel less tense and more relaxed.

For me, feeling less tense and more relaxed is:

Good / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Bad

19. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause muscle ache or fatigue.

For me, having muscle aches or fatigue is:

Bad / \_ / \_ / \_ / \_ / \_ / \_ / \_ / Good

6

20. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week during the next month in running, jogging, brisk walking, swimming, cycling, or calisthenics would improve my appearance.

For me, an improved appearance is:

Bad / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Good

21. The chances are \_\_\_\_\_ in 10 that most people who are important to me think I should spend, on the average, at least 20 minutes a day, four times a week during the next month in running, swimming, cycling, jogging, jumping rope, brisk walking, or calisthenics.

22. During the next month, I will spend, on the average, at least 20 minutes a day, four days a week in running, swimming, cycling, jumping rope, brisk walking, jogging or calisthenics: (Mark each scale.)

Probable / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Improbable

False / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / True

Likely / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Unlikely

Disagree / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Agree

- \*23. The chances are \_\_\_\_\_ in 10 that my spouse or house-mate wants me to spend, on the average, at least 20 minutes a day, four times a week during this next month in running, swimming, cycling, jogging, jumping rope, brisk walking, or calisthenics.

With regard to my engaging in physical exercise, I want to do what my spouse or house-mate wishes me to do.

Likely / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Unlikely

\*If you live alone, please omit question 23. Proceed to question 24.

24. The chances are \_\_\_\_\_ in 10 that other members of my family want me to spend, on the average, at least 20 minutes a day, four times a week during the next month in running, swimming, cycling, jogging, jumping rope, brisk walking, or calisthenics.

With regard to my engaging in physical exercise, I want to do what my other family members wish me to do.

Likely / \_\_\_\_\_ / Unlikely

25. The chances are \_\_\_\_\_ in 10 that my friends want me to spend, on the average, at least 20 minutes a day, four times a week during the next month in running, swimming, cycling, jogging, jumping rope, brisk walking, or calisthenics.

With regard to my engaging in physical exercise, I want to do what my friends wish me to do.

Likely / \_\_\_\_\_ / Unlikely

26. The chances are \_\_\_\_\_ in 10 that my boss or co-workers want me to spend, on the average, at least 20 minutes a day, four times a week during the next month in running, swimming, cycling, jogging, jumping rope, brisk walking, or calisthenics.

With regard to my engaging in physical exercise, I want to do what my boss or co-workers wish me to do.

Likely / \_\_\_\_\_ / Unlikely

8

In order that I may know more about those who are filling out this questionnaire, please complete the following:

<u>Age Range</u> (Check One)	<u>Sex</u> (Check One)	<u>Marital Status</u> (Check One)
<input type="checkbox"/> 30 - 34	<input type="checkbox"/> Male	<input type="checkbox"/> Never Married
<input type="checkbox"/> 35 - 39	<input type="checkbox"/> Female	<input type="checkbox"/> Married
<input type="checkbox"/> 40 - 44		<input type="checkbox"/> Widowed
<input type="checkbox"/> 45 - 50		<input type="checkbox"/> Separated or Divorced
<input type="checkbox"/> 51 - 55		

If married, does your spouse exercise regularly? ☐ Yes ☐ No

As a child, do you recall that either of your parents regularly engaged in an activity such as running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics for the purpose of obtaining physical exercise?

☐ Yes ☐ No

Highest level of schooling completed: (Check One)

<input type="checkbox"/> Highschool	<input type="checkbox"/> Master's Degree
<input type="checkbox"/> Some College Work	<input type="checkbox"/> Some Work Towards Doctorate
<input type="checkbox"/> Baccalaureate Degree	<input type="checkbox"/> Doctorate

Occupation \_\_\_\_\_

I very much appreciate your time and attention in completing this questionnaire.

\_\_\_\_ Please check here if you wish to receive a copy of the results of this investigation.

AFTER RECEIVING THE RESULTS OF THIS QUESTIONNAIRE, PLEASE CONTACT ME IF YOU HAVE ANY QUESTIONS.

## APPENDIX H

# **ATTITUDES TOWARDS EXERCISE**

*Copyright © 1982 Elizabeth C. Schmelling*

### DIRECTIONS FOR SELF-ADMINISTRATION OF QUESTIONNAIRE

The purpose of this questionnaire is to determine how you feel and what you believe about physical exercise. It may be that you never exercise, or you may exercise on a regular basis. For the purpose of this study, it does not matter. Your feelings and belief about exercise are **very** important— whether you actually do exercise is of no consequence.

There are two kinds of questions in this questionnaire. In the first, you are asked to estimate the "chances in 10" of an event taking place. For example:

The chances are \_\_\_\_\_ in 10 that eating breakfast on the average of at least 4 times a week during the next month would give me more pep and energy.

To respond to this question, make an estimate of the likelihood that eating breakfast as specified in the question would result in your having more pep and energy. If you are certain, or almost certain you would have more pep and energy as a result of eating breakfast at least four times a week for the next month, estimate the chances as **10** in 10, or perhaps **9** in 10. If you are quite sure that eating breakfast would **not** give you more pep and energy, estimate the chances as **0** in 10, or perhaps **1** in 10. If you believe that there is some probability that eating breakfast would make you more peppy, estimate the chances as **3** in 10, or perhaps **6** in 10, and so on. Please remember that:

1. Your answer must range from "0 in 10" to "10 in 10."
2. You should put down your best estimate; there are no right or wrong answers.

The second kind of question uses a pair or pairs of words to express your feelings about an event. For example, the following question would express your feelings about having more pep and energy.

For me, having more pep and energy is:

Good / \_\_\_\_\_ / Bad

If you felt that, for you, having more pep and energy was **very good** and/or **very important**, you would place an "X" mark in the space nearest the word "good.". If you felt neutral about having more pep and energy, you would place an "X" mark in the middle portion of the scale, and if you felt that, for you, having more pep and energy was **bad** and/or **unimportant**, you would place an "X" near the "bad" end of the scale. Notice that the word "good" includes the idea of "important" or of concern to you. "Bad" carries with it the idea of "unimportant" or not of concern to you. For example, many people might rate "having more pep and energy" as "good" but it would not be equally important or of equal concern to everyone.

Some questions will have more than one pair of words beneath it. For example:

For me, eating breakfast is: *(Mark each scale.)*

Good / \_\_\_\_\_ / X / \_\_\_\_\_ / Bad

Not Enjoyable / \_\_\_\_\_ / X / \_\_\_\_\_ / Enjoyable

Please remember to:

1. Place the "X" mark in the middle of the space, as shown above, not on the divider lines.
2. Never put more than one "X" mark on a single line.
3. Mark each scale if there is more than one pair of words following the question.

The questionnaire will take no more than 15 to 20 minutes to complete. Please do answer all questions; the confidentiality of your responses will be maintained. If you wish to receive a copy of the results of this study, check the box at the end of the questionnaire. Thank you very much for your time and assistance.

## QUESTIONNAIRE

1. The chances are \_\_\_\_\_ in 10 that I will spend, on the average, at least 20 minutes a day, four days a week, in running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics **during the next month**.

2. Most people who are important to me think that I should spend on the average at least 20 minutes a day, four days a week **during the next month** in running, swimming, jumping rope, cycling, brisk walking, jogging, or calisthenics. *(Mark each scale.)*

False / \_\_\_\_\_ / True

Likely / \_\_\_\_\_ / Unlikely

Probable / \_\_\_\_\_ / Improbable

Agree / \_\_\_\_\_ / Disagree

3. Devoting at least 20 minutes a day, four days a week **during this next month** to running, swimming, cycling, jumping rope, brisk walking, jogging or calisthenics would be, for me: *(Mark each scale.)*

Good / \_\_\_\_\_ / Bad

Worthless / \_\_\_\_\_ / Valuable

Boring / \_\_\_\_\_ / Interesting

Easy / \_\_\_\_\_ / Difficult

Convenient / \_\_\_\_\_ / Inconvenient

Enjoyable / \_\_\_\_\_ / Not Enjoyable

Possible / \_\_\_\_\_ / Impossible

Worth It / \_\_\_\_\_ / Not Worth It

Necessary / \_\_\_\_\_ / Unnecessary

4. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause me to work up a big appetite and to eat more.

For me, eating more is:

\* Good / \_\_\_\_\_ / Bad

5. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would give me more energy and stamina.

For me, having more energy and stamina is:

\* Good / \_\_\_\_\_ / Bad

*\*Remember that "good" includes the idea of "important" or "of concern," and that "bad" includes the idea of "unimportant" or "of no concern."*

6. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me feel good about myself.

For me, feeling good about myself is:

\*Bad / \_\_\_\_\_ / Good

7. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would mean my day had to be more highly structured.

For me, a more structured day is:

\*Bad / \_\_\_\_\_ / Good

8. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me lose weight.

For me, losing weight is:

\*Bad / \_\_\_\_\_ / Good

9. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause injury to some muscles or joints.

For me, injury to muscles or joints is:

\*Good / \_\_\_\_\_ / Bad

10. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause me to feel better in general.

For me, feeling better in general is:

\*Bad / \_\_\_\_\_ / Good

11. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would interfere with my usual daily routine.

For me, interference with my usual daily routine is:

\*Bad / \_\_\_\_\_ / Good

12. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling or calisthenics would strengthen my muscles.

For me, increased muscle strength is:

\*Bad / \_\_\_\_\_ / Good

*\*Remember that "good" includes the idea of "important" or "of concern," and that "bad" includes the idea of "unimportant" or "of no concern."*

13. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging brisk walking, swimming, cycling, or calisthenics would make me more mentally alert.

For me, being more alert mentally is:

\*Good / / / / / / / / / / Bad

14. The chances are \_\_\_\_\_ in 10 that spending on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would aggravate a health condition which I may have.

For me, having a health condition aggravated is:

\*Good / / / / / / / / / / Bad

15. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me stay healthy and resist colds.

For me, staying healthy and resisting colds is:

\*Good / / / / / / / / / / Bad

16. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would strengthen my heart and lungs.

For me, strengthening my heart and lungs is:

\*Bad / / / / / / / / / / Good

17. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would take time away from my usual responsibilities.

For me, having time taken away from my usual responsibilities is:

\*Bad / / / / / / / / / / Good

18. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would help me feel less tense and more relaxed.

For me, feeling less tense and more relaxed is:

\*Good / / / / / / / / / / Bad

19. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would cause muscle ache or fatigue.

For me, having muscle aches or fatigue is:

\*Bad / / / / / / / / / / Good

*\*Remember that "good" includes the idea of "important" or "of concern," and that "bad" includes the idea of "unimportant" or "of no concern."*

20. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would improve my appearance.

For me, an improved appearance is:

\*Bad / \_\_\_\_\_ / Good

21. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would make me too tired to carry out my daily responsibilities.

For me, being too tired to carry out my daily responsibilities is:

\*Bad / \_\_\_\_\_ / Good

22. The chances are \_\_\_\_\_ in 10 that spending, on the average, at least 20 minutes a day, four days a week **during the next month** in running, jogging, brisk walking, swimming, cycling, or calisthenics would take up time which I now spend relaxing.

For me, spending time on exercise rather than relaxation would be:

\*Bad / \_\_\_\_\_ / Good

23. **During the next month**, I will spend, on the average, at least 20 minutes a day, four days a week in running, swimming, cycling, jumping rope, brisk walking, jogging or calisthenics; *(Mark each scale.)*

Probable / \_\_\_\_\_ / Improbable

False / \_\_\_\_\_ / True

Likely / \_\_\_\_\_ / Unlikely

Disagree / \_\_\_\_\_ / Agree

24. The chances are \_\_\_\_\_ in 10 that my spouse or house-mate wants me to spend, on the average, at least 20 minutes a day, four times a week **during this next month** in running, swimming, cycling, jogging, jumping rope, brisk walking, or calisthenics. *(Omit if not applicable.)*

With regard to my engaging in physical exercise, I want to do what my spouse or house-mate wishes me to do.

Likely / \_\_\_\_\_ / Unlikely

25. The chances are \_\_\_\_\_ in 10 that other members of my family want me to spend, on the average, at least 20 minutes a day, four times a week **during the next month** in running, swimming, cycling, jogging, jumping rope, brisk walking or calisthenics.

With regard to my engaging in physical exercise, I want to do what my other family members wish me to do.

Likely / \_\_\_\_\_ / Unlikely

\*Remember that "good" includes the idea of "important" or "of concern," and that "bad" includes the idea of "unimportant" or "of no concern."

26. The chances are \_\_\_\_\_ in 10 that my friends want me to spend, on the average, at least 20 minutes a day, four times a week **during the next month** in running, swimming, cycling, jogging, jumping rope, brisk walking or calisthenics.

With regard to my engaging in physical exercise, I want to do what my friends wish me to do.

Likely / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Unlikely

27. The chances are \_\_\_\_\_ in 10 that my boss or co-workers want me to spend, on the average, at least 20 minutes a day, four times a week **during the next month** in running, swimming, cycling, jogging, jumping rope, brisk walking or calisthenics.

With regard to my engaging in physical exercise, I want to do what my boss or co-workers wish me to do.

Likely / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / Unlikely

In order that I may know more about those who are filling out this questionnaire, please complete the following:

Age Range (Check One)	Sex (Check One)	Marital Status (Check One)
_____ 30-34	_____ Male	_____ Never Married
_____ 35-39	_____ Female	_____ Married
_____ 40-44		_____ Widowed
_____ 45-50		_____ Separated or Divorced
_____ 51-55		

If married, does your spouse exercise regularly? \_\_\_\_\_ Yes \_\_\_\_\_ No

As a child, do you recall that either of your parents regularly engaged in an activity such as running, swimming, cycling, jumping rope, brisk walking, jogging, or calisthenics for the purpose of obtaining physical exercise?

\_\_\_\_\_ Yes \_\_\_\_\_ No

Highest level of schooling completed: (Check One)

_____ Highschool	_____ Master's Degree
_____ Some College Work	_____ Some Work Towards Doctorate
_____ Baccalaureate Degree	_____ Doctorate

Occupation \_\_\_\_\_

Please estimate the amount of free or leisure time available to you each day.

_____ Less than one hour	_____ 2 - 3 hours
_____ 1 - 2 hours	_____ More than 3 hours

I very much appreciate your time and attention in completing this questionnaire.

\_\_\_\_\_ Please check here if you wish to receive a copy of the results of this investigation.

## APPENDIX I

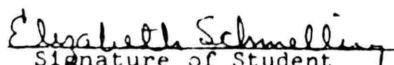
TEXAS WOMAN'S UNIVERSITY  
COLLEGE OF NURSINGAGENCY PERMISSION FOR CONDUCTING STUDY\*THE East Central Oklahoma State UniversityGRANTS TO Elizabeth C. Schmelling

a student enrolled in a program of nursing leading to a Doctor's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem.

The problem is the identification of selected variables related to the practice of physical exercise. The variables to be examined include: 1) the perceived consequences of exercise, 2) the evaluation of these consequences, 3) the perceived wishes of others with regard to exercise, and 4) the desire of the subject to comply with their wishes. Additionally, data will be sought regarding age range, sex, marital status, occupational grouping, education, and previous experience with exercise. Data will be gathered by means of a self-administered, closed format questionnaire of approximately fifty items.

The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~may not~~) be identified in the final report.
3. The agency (~~wants~~) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other \_\_\_\_\_

Date: August 25, 1981  
Signature of Agency Personnel  
Signature of Student\_\_\_\_\_  
Signature of Faculty Advisor

\*Fill out & sign three copies to be distributed as follows:  
Original - Student; First copy - Agency; Second copy - TWU  
College of Nursing.

TEXAS WOMAN'S UNIVERSITY  
COLLEGE OF NURSING

AGENCY PERMISSION FOR CONDUCTING STUDY\*

THE Southwestern Oklahoma State University

GRANTS TO Elizabeth C. Schmelling

a student enrolled in a program of nursing leading to a Doctor's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem.

The problem is the identification of selected variables related to the practice of physical exercise. The variables to be examined include: 1) the perceived consequences of exercise, 2) the evaluation of these consequences, 3) the perceived wishes of others with regard to exercise, and 4) the desire of the subject to comply with their wishes. Additionally, data will be sought regarding age range, sex, marital status, occupational grouping, education, and previous experience with exercise. Data will be gathered by means of a self-administered, closed format questionnaire of approximately fifty items. The conditions mutually agreed upon are as follows:

1. The agency (may) (~~may not~~) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (~~may not~~) be identified in the final report.
3. The agency (wants) (~~does not want~~) a conference with the student when the report is completed.
4. The agency is (willing) (~~unwilling~~) to allow the completed report to be circulated through interlibrary loan.
5. Other Individuals are not to be identified.

Date: Sept 8, 1981

Earl C. Kinsley, Jr. President  
Signature of Agency Personnel

Elizabeth C. Schmelling  
Signature of Student

\_\_\_\_\_  
Signature of Faculty Advisor

\*Fill out & sign three copies to be distributed as follows:  
Original - Student; First copy - Agency; Second copy - TWU College of Nursing.

## References

- Ajzen, I., & Fishbein, M. The prediction of behavioral intentions in a choice situation. Journal of Experimental Social Psychology, 1967, 5, 41-57.
- Ajzen, I., & Fishbein, M. Attitudes and normative beliefs as factors influencing behavioral intentions. Journal of Personality and Social Psychology, 1972, 21, 1-9.
- Ajzen, I., & Fishbein, M. Attitudinal and normative variables as predictors of specific behaviors. Journal of Personality and Social Psychology, 1973, 27, 41-57.
- Anastasi, A. Psychological Testing. New York: MacMillan, 1969.
- Atkinson, J. W. Motivational determinants of risk-taking behavior. Psychological Bulletin, 1957, 64, 359-372.
- Babbie, E. Survey Research Methods. Belmont, California: Wadsworth Publishing Company, 1973.
- Bandura, A., Blanchard, E., & Ritter, B. Relative efficacy of desensitization and modeling procedures for inducing behavioral, affective, and attitudinal changes. Journal of Personality and Social Psychology, 1969, 13, 173-199.
- Becker, M., Drachman, R., & Kirscht, J. Motivations as predictors of health behavior. Health Service Reports, 1972, 87, 24-31.
- Becker, M., Drachman, R., & Kirscht, J. A new approach to explaining sick role behavior in low income populations. American Journal of Public Health, 1974, 64, 205-216.
- Becker, M., Drachman, R., & Kirscht, J. Predicting Mother's compliance with pediatric medical regimens. Journal of Pediatrics, 1977, 18, 843-854.
- Becker, M., & Maiman, L. Socio-behavioral determinants of compliance with health and medical care recommendations. Medical Care, 1975, 13, 11-24.

- Becker, M., Maiman, L., Kirscht, J., Heafner, D., & Drachman, R. The health belief model and prediction of dietary compliance: a field experiment. Journal of Health and Social Behavior, 1977, 18, 348-366.
- Belloc, N., & Breslow, L. Relationship of physical health status and health practices. Preventive Medicine, 1972, 1, 409-421.
- Bettman, J., Capon, N., & Lutz, R. Cognitive algebra in multi-attribute attitude models. Journal of Marketing Research, 1974, 12, 357-374.
- Bowman, C., & Fishbein, M. Understanding public reactions to energy proposals: an application of the Fishbein model. Journal of Applied Social Psychology, 1978, 8, 319-340.
- Campbell, D. T., & Fiske, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 1959, 56, 81-105.
- Cohen, J. B. Toward an integrated use of expectancy-value attitude models. In D. Hughes & M. L. Ray (Eds.) Buyer/Consumer Information Processing, Chapel Hill, North Carolina: University of North Carolina: University of North Carolina Press, 1974.
- Cowling, A. B. Consequences of applying the Fishbein model to advertising planning. Seminar on Translating Advanced Advertising Theories into Research Reality, European Society for Opinion and Marketing Research, Madrid, Spain, 1971.
- Davis, M., & Runge, R. Beliefs and attitudes in a gubernatorial primary: some limitations of the Fishbein model. Journal of Applied Social Psychology, 1981, 11, 93-113.
- deVries, H. Physiology of exercise and aging. In G. Lesnoff-Carailagua (Ed.), Health Care of the Elderly (Vol 1), New York: Sciences Press, 1980.
- DuBois, P. An Introduction to Psychological Statistics. New York: Harper and Row, 1965.
- Edwards, W. The theory of decision-making. Psychological Bulletin, 1954, 51, 380-417.
- Feather, N. T. Subjective probability and decision-making under uncertainty. Psychological Review, 1959, 66, 150-164.

- Fishbein, M. Readings in Attitude Theory and Measurement. New York: John Wiley & Sons, Inc., 1967.
- Fishbein, M. Some comments on the use of "models" in advertising research. Seminar on Translating Advanced Advertising Theories Into Research Reality, European Society for Opinion and Marketing Research, Madrid, Spain, 1971, 297-318.
- Fishbein, M. Attitude, attitude change, and behavior. In P. Levine (Ed.), Attitude Research Bridges the Atlantic. Chicago, Illinois: Marketing Research Division, 1975, 3-16.
- Fishbein, M. Misconceptions about the Fishbein model: reflections on a study by Songer-Nocks. Journal of Experimental Social Psychology, 1976, 12, 579-584.
- Fishbein, M. Persuasive communication. In A. F. Bennet (Ed.), Communications Between Doctors and Patients. London: Oxford University Press, 1976, 101-127.
- Fishbein, M. & Ajzen, I. Attitudes and opinions. Annual Review of Psychology, 1972, 23, 487-545.
- Fishbein, M., & Ajzen, I. Belief, Attitude, Intention, and Behavior. Reading, Mass., Wesley Publishing Company, 1975.
- Fishbein, M., Martinsen, C. D. & Sereno, K. K. Advances in Communication Research. New York: Harper and Row, 1973.
- Fretwell, A. Efficacy of a patient activation health education program for elderly women. (Doctoral dissertation, University of Utah, 1977). Dissertation Abstracts International, 1977, 38, (01), B, 0132B (University Microfilms No. 77-14,608).
- Gartner, A., & Reissman, F. Self-help models and consumer intensive health practice. American Journal of Public Health, 1976, 66, 783-786.
- Glass, G., & Stanley, J. Statistical Methods in Education and Psychology. New Jersey: Prentice-Hall, Inc., 1970.
- Green, L. Should health education abandon attitude change strategies? Perspectives from recent research. Health Education Monographs, 1970, 30, 25-48 (a).
- Green, L. Status identity and preventive health behavior. Pacific Health Education Reports, 1970, 24-37 (b).

- Green, P., & Wind, Y. Multiattribute Decisions in Marketing. Illinois: The Dryden Press, 1973.
- Guilford, J. P., & Fruchter, B. Fundamental Statistics in Psychology and Education (5th ed.). New York: McGraw-Hill Book Company, 1973.
- Halfman, M., & Hojnacki, L. Exercise and the maintenance of health. Topics in Clinical Nursing, July, 1982, 1-10.
- Harrell, G., & Bennett, P. D. An evaluation of the expectancy-value model of attitude measures for physician prescribing behavior. Journal of Market Research, 1974, 11, 269-278.
- Harris, L. Health Maintenance. New York: Pacific Mutual Life Insurance Company, 1978.
- Harris L. Fitness in America. New York: The Perrier Study, 1979.
- Heberlein, T., & Black, J. S. Attitudinal specificity and the prediction of behavior in a field setting. Journal of Personality and Social Psychology, 1976, 33, 474-479.
- Heinzelmann, F., & Bagley, R. Response to physical activity programs and their effects on health behavior. Public Health Reports, 1970, 85, 905-911
- Hochbaum, G. An alternate approach to health education. Health Values: Achieving High Level Wellness, 1979, 3, 197-201.
- Homant, R. Semantic differential ratings and rank ordering of values. Educational and Psychological Measurement, 1969, 29, 885-889.
- Hughes, G. D. Trends in the development of multi-attribute models of central information processing. In G. D. Hughes & M.L. Ray (eds.), Buyer/Consumer Information Processing. Chapel Hill, North Carolina: University of North Carolina Press, 1974.
- Illich, I. Medical Nemesis, The Exploitation of Health. New York: Pantheon Books, 1976.
- Jaccard, J. A theoretical analysis of selected factors important to health education strategies. Health Education Monographs, 1975, 3, 152-167.
- Jaccard, J., & Davidson, A. A comparison of two models of social behavior: results of a survey sample. Sociometry, 1965, 38, 497-517.

- Juster, F. T. Consumer buying intentions and purchase probability: an experiment in survey design. Journal of the American Statistical Association, 1966, 61, 658-697.
- Kahneman, D., & Tversky, A. The psychology of preference. Scientific American, 1982, 246, 160-173.
- Kaplan, G. & Cowles, A. Health locus of control and health value in the prediction of smoking reduction. Health Education Monographs, 1978, 6, 73-84.
- Kasl, S. Modification of behavior to reduce chronic disease risk: smoking. Health Education Monographs, 1974, 2, 24-37.
- Kasl, S. V., & Cobb, S. Health behavior, illness behavior, and sick role behavior. Archives of Environmental Health, 1966, 1, 246-266.
- Kathaudapani, V. Validation of feeling, belief, and intention to act as three components of attitude and their contribution to prediction of contraceptive behavior. Journal of Personality and Social Psychology, 1971, 19, 321-333.
- Knowles, J. The responsibility of the individual. Daedalus, 1977, 106, 57-80.
- Kowalski, B. R. Chemometrics: pattern recognition. Analytical Chemistry, 1980, 52, 112R-122R.
- Kristein, M. Arnold, C., & Wynder, E. Health economics and preventive care. Science, 1977, 194, 457-462.
- Langlie, J. Social networks, health beliefs, and preventive health behavior. Journal of Health and Social Behavior, 1977, 18, 244-260.
- Levin, L., Katz, A., & Holst, E. Self-care: Lay Initiatives in Health. New York: Prodist, 1976.
- Levin, L., Forces and issues in the revival of interest in self-care: impetus for redirection in health. Health Education Monographs, 1977, 5, 115-135.
- Levin, L. The layperson as primary health care practitioner. Nursing Digest, 1978, 17-22.

- Likert, R. The method of constructing an attitude scale. In G. Maranell (Ed.), Scaling: A Sourcebook for Behavioral Scientists. Chicago: Aldine Publishing Company, 1974.
- Liska, A. Attitude-behavior consistency as a function of generality equivalence between attitude and behavior objects. Journal of Psychology, 1974, 86, 217-228 (a).
- Liska, A. Emergent issues in the attitude-behavior consistency controversy. American Sociological Review, 1974, 39, 261-272 (b).
- Lutz, R. Changing brand attitudes through modification of cognitive structure. Journal of Consumer Research, 1975, 1, 49-59.
- Mackie, M. Perception of beneficial health behavior: smoking and exercise. Canadian Journal of Public Health, 1975, 66, 481-487.
- Maiman, L., & Becker, M. The health belief model: origins and correlates in psychological theory. In M. Becker (Ed.), The Health Belief Model and Personal Health Behavior. New York: Charles B. Slack, 1974.
- Makower, J. A guide to executive fitness. Eastern Review, 1982, 87-93.
- Martin, B. L. The relationship of health beliefs of working adults to perceived costs and practice of preventive health behavior (Doctoral dissertation, University of Iowa, 1980). Dissertation Abstracts International, 1980, 41 (04), Sec. A, 1415. (University Microfilms No. 80-22047)
- Mausner, B. An ecological view of cigarette smoking. Journal of Abnormal Psychology, 1973, 81, 115-126.
- McCarty, D. Changing contraceptive usage intentions: a test of the Fishbein model of intention. Journal of Applied Social Psychology, 1981, 11, 192-211.
- McDonald, C. A brief critique of the Fishbein and other attitude models. In Seminar on Translating Advanced Advertising Theories into Research Reality. Madrid, Spain, European Society for Opinion and Marketing Research, 1971.
- Mechanic, D. The stability of health and illness behavior: results from a 16-year follow-up. American Journal of Public Health, 1979, 69, 1142-1145.

- McKinley, J. B. Some approaches and problems in the study of the use of services--an overview. Journal of Health and Social Behavior, 1972, 13, 115-152.
- Milo, N. A framework for prevention: changing health damaging to health generating life patterns. American Journal of Public Health, 1976, 66, 435-439.
- Moinpour, R., Wiley, J. B. An approach to the resolution of multicollinearity in the attribute structure of attitudes. In Proceedings of the Annual Conference for Consumer Research, 3, University of Maryland, College Park, 1972.
- Morrison, D. F. Multivariate Statistical Methods. New York: McGraw-Hill Book Co., 1967.
- Osgood, C., Suci, G., Tannenbaum, P. The Measurement of Meaning. Illinois: The University of Illinois Press, 1957.
- Pender, N. The influence of personal attitudes and the expectations of others on the occurrence of health-promoting behaviors in adults. In Synopsis of Selected Clinical Studies. New York: American Nurses Association, 1979.
- Pender, N. Health Promotion in Nursing Practice. Connecticut: Appleton-Century-Crofts, 1982.
- Pessemier, R., & Wilkie, W. L. Multi-attribute change theory. In G. D. Hughes & M. L. Ray (Eds.) Buyer/Consumer Information Processing. Chapel Hill, North Carolina: University of North Carolina Press, 1974.
- Petitti, D., Friedman, G., & Kahn, W. Accuracy of information on smoking habits provided on self-administered research questionnaires. American Journal of Public Health, 1981, 71, 308-311.
- Polit, D., & Hungler, B. Nursing Research: Principles and Methods. Philadelphia: J. B. Lippincott Company, 1978.
- Pomazal, R., & Jaccard, J. An informational approach to altruistic behavior. Journal of Personality and Social Psychology, 1976, 33, 317-326.
- Pratt, L. The relationship of socioeconomic status to health. American Journal of Public Health, 1971, 61, 281-291.

- Rokeach, M. The Nature of Human Values. New York: The Free Press, 1973.
- Rosenstock, I. The health belief model and preventive health behavior. In M. Becker (Ed.), The Health Belief Model and Personal Health Behavior. New Jersey: Charles B. Slack, Inc., 1974 (a).
- Rosenstock, I. Historical origins of the health belief model. In M. Becker (Ed.), The Health Belief Model and Personal Health Behavior. New Jersey: Charles B. Slack, Inc., 1974 (b).
- Rosenstock, I. & Kirscht, J. Why people seek health care. In G. Stone (Ed.), Health Psychology--A Handbook. San Francisco: Josey-Bass Publishers, 1979.
- Rotter, J. B. Social Learning and Clinical Psychology. New York: Prentice-Hall, Inc., 1954.
- Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, (1, whole No. 609).
- Ruffing, M. A. Preventive health behavior: a theoretical review and synthesis. Health Values: Achieving High Level Wellness, 1979, 3, 235-240.
- Ryan, M., & Bonfield, E. H. The extended Fishbein model: additional insights and problems. Advances in Consumer Research, 1975, 11, 265-283 (a).
- Ryan, M., & Bonfield, E. H. The Fishbein extended model and consumer behavior. Journal of Consumer Research, 1975, 2, 118-136 (b).
- Ryan, M. & Etzel, M. The nature of salient outcomes and referents in the extended model. Advances in Consumer Research, 11, 485-490.
- Saltzer, E. Causal beliefs and losing weight: a study of behavioral intention theory and locus of control in the prediction of health-related behavior (Doctoral dissertation, University of California at Irvine, 1979). Dissertation Abstracts International, 1979, 40 (04), 1647 B. (University Microfilms No. 79-22856)
- Saltzer, E. Cognitive moderators of the relationship between behavioral intentions and behavior. Journal of Personality and Social Psychology, 1981, 41, 260-70.

- Schelzel, F. W. An application of the health belief model to a preventive health behavior among high risk heart disease screening program participants (Doctoral dissertation, Pennsylvania State University, 1977). Dissertation Abstracts International, 1977, 38 (02), 6333 A. (University Microfilms No. 77-14,608).
- Schlegel, R., Crawford, C., & Sanborn, M. Correspondence and mediational properties of the Fishbein model: an application to adolescent alcohol use. Journal of Experimental Social Psychology, 1977, 13, 421-430.
- Schmelling, E. An Investigation of Selected Aspects of Primary Health Care. Unpublished manuscript, 1980. (Available from Division of Nursing, East Central University, Ada, OK 74820) (a).
- Schmelling, E. Pilot Study to Investigate the Applicability of the Model of Behavioral Intent to Chronic Disease Screening Clinic Attendance Among Senior Citizens. Unpublished manuscript, 1980. (Available from Division of Nursing, East Central University, Ada OK 74820) (b).
- Schwartz, S., & Tessler, R. A test of a model for reducing measured attitude-behavior discrepancies. Journal of Personality and Social Psychology, 1972, 24, 225-236.
- Sennott, L. A. Value-expectancy theory and health behavior: an exploration of motivating variables (Doctoral dissertation, University of Arizona, 1980). Dissertation Abstracts International, 1980, 40 (11) 6013 A. (University Microfilms No. 80-22,047).
- Sheth, J., Talarzyk, W. W. Perceived instrumentality and value importance as determinants of attitude. Journal of Marketing Research, 1972, 9, 6-9.
- Smetana, J., & Adler, N. Fishbein's value X expectancy model: an examination of some assumptions. Personality and Social Psychology Bulletin, 1980, 6, 89-96.
- Smurl, J. Distributing the burden fairly: ethics and national health policy. Man and Medicine, 1980, 5, 97-125.
- Snedecor, G. & Cochran, W. Statistical Methods. Ames, Iowa: Iowa State University Press, 1961.
- Somers, A., & Somers, H. Health and Health Care. Germantown, Md.: Aspen Systems Corp., 1977.

- Songer-Nocks, E. Situational factors affecting the weighting of predictor components in the Fishbein model. Journal of Experimental Social Psychology, 1976, 12, 56-69.
- Steele, J., & McBroom, W. Conceptual and empirical dimensions of health behavior. Journal of Health and Social Behavior, 1972, 13, 382-392.
- Suchman, H., & Johnson, M. Attitudes and behaviors. Annual Review of Sociology, 1976, 2, 161-207.
- Thomas, L. The health care system. Science 80, 1979, 1, 17-21.
- Tversky, A., & Kahneman, D. The framing of decisions and the psychology of choice. Science, 1981, 211, 453-458.
- United States Department of Health, Education, and Welfare: Public Health Service. Healthy People. DHEW (PHS) Publication No. 70-55071. Washington, D.C.: Author, 1979.
- Wahlquist, Glen. Factors influencing the decision to remain a participant in a cardiac exercise program (Doctoral dissertation, University of Pittsburgh, 1977). Dissertation Abstracts International, 1977, 39 (01), 0142 A (University Microfilms No. 77-9611)
- Wallston, B. S. & Wallston, K. A. Locus of control and health: A review of the literature. Health Education Monographs, 1978, 6, 107-117.
- Weigel, R., Vernon, D., & Tognacci, L. Specificity of attitude as a determinant of attitude-behavior congruence. Journal of Personality and Social Psychology, 1974, 30, 724-738.
- Wilker, D. Coercive measures in health promotion: can they be justified? Health Education Monographs, 1978, 5, 221-232.
- Williams, A., & Wechsler, H. Interrelationship of preventive action in health and other areas. Health Services Reports. 1972, 87, 969-976.
- Yankelovich, I., Skelly, R., & White, R., Inc. Family Health in an Era of Stress. The General Mills American Family Report. New York: 1978-1979.
- Yeung, E. D. Pattern recognition by audio representation of multivariate analytical data. Analytical Chemistry, 1980, 52, 1120-1123.