A STUDY OF CARDIOVASCULAR HEALTH BEHAVIOR IN MANITOBA

by

J. Mark Badger

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ABSTRACT

The purpose of this study was to examine smoking patterns as health behavior. The decision to not smoke was seen as a way to avoid cardiovascular disease and/or maintain cardiovascular health.

A modified version of the Health Belief Model was used to try to explain smoking behavior. The relationships between various aspects of the model, such as contact with heart disease, perceived health status, perceived threat of the disease, and degree of internal locus of control were analyzed. The relationships between these variables and smoking behavior were also studied (both individually and collectively). Particular emphasis was placed upon the relationship between socioeconomic status and the other variables in the model.

The sample consisted of 1034 people, 20 years and older, from across Manitoba. A mail out survey was used to collect the data.

Few of the expected relationships were substantiated by the data. An attempt was made to explain the inconsistencies with previous studies. Suggestions for further research are offered.

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Chapter I

THE HEALTH BELIEF MODEL

1.1 INTRODUCTION

The purpose of this study is to examine cardiovascular health behavior among a sample of Manitobans. Health behavior refers to the actions undertaken by persons, who believe themselves to be healthy, to maintain their health status. An attempt will be made in this study to explore the reasons why a person who feels healthy will undertake steps to remain healthy and/or prevent illness and disease. Actions taken to prevent illness will be the focus of this study, rather than activities involved in treating and overcoming an illness. The specific context within which health behavior will be investigated is the prevention of cardiovascular disease (or the maintainance of cardiovascular health). The Health Belief Model has been selected as the theoretical basis to be used for identifying and analyzing various factors which may influence health behavior.

1.2 STAGES IN THE HEALTH/ILLNESS PROCESS

Kasl and Cobb (1966) conceptualized health and illness as a process consisting of three stages. These stages are termed "health behavior", "illness behavior", and "sick role behavior". They define health behavior as "any activity undertaken by a person who believes himself to be healthy for the purpose of preventing disease or detecting disease in an asymptomatic stage" (Kasl and Cobb, 1966:246). In this stage, the individual perceives that he or she is healthy, i.e. no symptoms of a particular disease or illness are apparent to the person. Health behavior is any action that is taken by the individual to maintain his/her perceived health status, or to avoid a particular illness or disease. For example, an individual who believes he/she is in good health may exercise regularly to maintain this health status and to avoid illness and disease. The exercise program is a preventive measure, in the absence of any disease or illness symptoms. It is therefore a health behavior.

According to the definition, the detection of disease in an "asymptomatic stage" is also considered to be a health behavior. This refers to efforts by the individual to discover the presence of any disease, in the absence of perceived symptoms. An example of this behavior is a preventive medical check-up. The person feels healthy, but may have periodic check-ups to see if he/she has any health problems that have not yet become apparent.

Illness behavior is defined as "any activity, undertaken by a person who feels ill, to define the state of his health and to discover a suitable remedy" (Kasl and Cobb, 1966:246). This involves relating the perceived symptoms to others, in an effort to determine the specific nature of the illness or disease. The individual may describe his/her symptoms to relatives, friends, co-workers, health professionals, or any other persons who may have some knowledge of the meaning of the symptoms. An effort is made to determine the exact nature of the disease or illness and to find an appropriate treatment to combat the condition.

Once the illness or disease has been defined and a treatment selected, the person moves into the sick role stage, if the malady is still present. Sick role is "the activity undertaken by those who consider themselves ill, for the purpose of getting well" (Kasl and Cobb, 1966:246). In this stage, the individual follows the treatment program suggested and attempts to regain his/her health status.

The perception of being in good health is unique to health behavior. The actions involved in illness and sick role behavior are intended to <u>define</u> and <u>treat</u> an illness or disease. The actions in health behavior are meant to <u>maintain</u> good health or <u>prevent</u> illness or disease. Health behavior occurs in the <u>absence</u> of symptoms. Illness and sick role behavior occurs in the <u>presence</u> of symptoms. In order to better understand the process involved in health and ill-

ness, actions taken in the absence of symptoms must be studied. Health behavior is a key stage in the process. A knowledge of actions taken after symptoms are perceived will yield only partial understanding of the health/illness process.

The categories of health behavior, illness behavior and sick role behavior encompass physical, psychological, and social levels of functioning. All of these levels of functioning are affected during the health/illness process (as illustrated in Figure 1). In this process, illness is seen as "a disturbance of some normal function of body processes, marked by certain symptoms, and taking a certain course" (Kasl and Cobb, 1966:247). Physically, the person begins with a state of health (absence of disease), and progresses through asymptomatic disease that is susceptible to detection, disease that is not yet diagnosed, and manifest disease at the time of diagnosis. These stages are followed by the course of disease as influenced by treatment, and finally the outcome of the disease. That is, the disease is either cured, held in abeyance, or is fatal. (Kasl and Cobb, 1966:247).

FIGURE 1

STAGES IN THE HEALTH/ILLNESS PROCESS

LEVELS OF FUNCTIONING	HEALTH BEHAVIOUR		ILLNESS BEHAVIOUR		SICK ROLE BEHAVIOUR	
PSYCHOLOGICAL	Feel Healthy		Feel Ill/Sick		Consider Self Sick	
SOCIAL	Perform Usual Well Roles (asymptomatic prevention and detection)		Diminished Functioning (definitional	Preparing to Enter the Sick Role and help-seeking)	Being in the sick role (dependency)	Leaving the sick role (recovery)
PHYSICAL	Health	Asymptomatic Disease	Signs and Symptoms	Diagnosis	Treatment	Outcome

-adapted from Kasl and Cobb 1966:248

Changes in social and psychological functions parallel the physical stages within health behavior, illness behavior, and sick role behavior. The changes that occur at the social level are reflected in the individual's ability to perform his or her normal social roles. As the illness/disease progresses, the person's obligations to perform normal roles diminish. The person eventually adopts the sick role, which carries other obligations. The individual in the sick role is under an obligation to try to regain his or her good health. Furthermore, the occupant of the sick role is expected to seek help and to accept the prescribed treatment.

The distinction drawn by Kasl and Cobb between psychological functioning and social functioning reflects the "personal and situational (role) determinants of behavior; an individual's action may be seen as a joint function of the role demands and of self identity." (Kasl and Cobb 1966:248). The separation of social and psychological functioning also allows for the study of the "internalization of role demands, the process of identity formation or change which results from acceptance of the demands of one's major life roles as one's own rules of behavior" (Kasl and Cobb 1966:248). For example, a long period of time in the sick role will lead to a change in the self identity from "I feel healthy" to "I am sick".

The three types of behavior present different problems for research. In health behavior, the researcher wants to find "under what circumstances, in the absence of symptoms, will individuals engage in health behavior or preventive health practices?" (Kasl and Cobb 1966:248). Research in illness behavior seeks to find "when will the presence of symptoms lead to seeking diagnosis and treatment?" (Kasl and Cobb 1966:248). Sick role research studies "when will the individual adopt the sick role and what are the determinants of the length of the sick role period; that is, what variables influence not only the acceptance of treatment but also the rate of convalescence and resumption of normal obligations?" (Kasl and Cobb 1966:248).

1.3 HISTORICAL DEVELOPMENT OF THE MODEL

Rosenstock, Hochbaum, Leventhal, Kegeles, and other researchers in the 1950's and 1960's tried to develop a theory that could explain health behavior. That is, a theoretical model that could explain the circumstances under which people are likely to take preventive measures against disease, in an asymptomatic state. Efforts were undertaken to develop a theory that could account for why some people would not participate in preventive behaviors in relation to tuberculosis, cervical cancer, dental disease, rheumatic fever, polio, and influenza (Becker 1974:1). Most of these health behaviors were relatively low in cost. Therefore, the developing theory had to deal with other factors that influ-

ence a person's decision not to engage in recommended health behavior.

These factors that influence health behavior had not been analyzed because, to that point most of the previous research on the health/illness process had dealt with illness behavior (Kadushin, 1958; Ludwig and Gibson, 1969; Mechanic, 1962, 1978; Zola, 1965, 1966; Koos, 1954; Suchman, 1966). These studies describe illness as an undesirable condition, and illness behavior an action taken to overcome this situation. In contrast, researchers working in the health behavior field believed that good health has a positive valence that will attract the individual to health maintenance activities, in the absence of illness or disease. (Anything that the person views as a desirable goal to be attained is said to have positive valence. Anything that an individual wishes to avoid is said by Lewin to have negative valence.)[1] Thus the Health Belief Model (HBM) was developed.

The researchers who developed the HBM were influenced by Lewin's hypothesis that "it is the world of the perceiver that determines what he will do and not the physical environment, except as the physical comes to be represented in the mind of the behaving individual" (Becker 1974:2). While the emphasis was on health, the concept of disease as negative valence was also incorporated into the model. This

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[1] For a more complete explanation of valence and other concepts of Lewin, see Lewin (1935,1936,1938,1951).

negative valence exerts a force upon the individual, moving him or her away from the region associated with disease, unless the movement would cause that person to move to an area of greater negative valence (Becker 1974).[2]

If these were the only forces acting upon the individual, there would be no conflict.[3] The individual would be repelled from illness and attracted to good health. Yet, there may be factors associated with achieving good health that discourage the individual from undertaking health maintenance activities. For example, a program of exercise, proper diet, not smoking, and avoiding stress is associated with good health. The result of this program, increased chance of good health, is often viewed as a positive goal. Yet, the program to attain this goal may be perceived as too expensive in time, effort, pain, or money. The strengths of the valences are based upon the person's perceptions of health and the associated health program. For some people, the negative valence associated with the health program may be stronger than the positive valence of good health. In such cases, the person would not undertake a program to improve his or her health. Conversely, the negative force associated with the health program may be weaker than the positive valence of good health. Theoretically, in this

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[2] Force refers to the relative affect a situation has upon an individual.

[3] According to Lewin, conflict results whenever the individual must choose between two or more options.

situation, health behavior will occur.

1.4 CONCEPTUAL DIMENSIONS AND SOURCES OF VARIATION IN THE MODEL

According to the Health Belief Model (HBM), three major variables are seen as important in the decision to initiate or continue health behavior. It is hypothesized that in order for a person to exhibit health behavior, the individual must believe:

1. he or she is personally susceptible to the particular disease;
2. the disease would have serious consequences for his or her life; and
3. a particular action would be beneficial by "reducing his susceptibility to the condition or if the disease occurred, by reducing its severity, and that it would not entail overcoming important psychological barriers such as cost, convenience, pain, embarrassment" (Becker 1974:3).

1.4.1 Perceived Susceptibility

Becker (1974:3) defines susceptibility as "subjective risks of contracting a condition". At one end of a continuum of values for this dimension is a person who denies any possibility of contracting a given disease. At the other end of the continuum is a person who feels he/she is in real danger of contracting the disease. The midpoint of this scale is a

person who admits the statistical probability that he or she will contract the disease (Becker 1974:3).

The individual's perceived susceptibility plays a more important part than his or her objective susceptibility, in the decision whether or not to take preventive health measures. "Subjective probability" is more predictive of behavior than "objective probability" (Lewin 1951:58). A perceived threat, regardless of its objective probability, will cause more behavioral change than an objective threat that is not perceived by the individual. The individual's unique perceptions of his or her situation are crucial in any analysis of that individual's behavior. The situation, as defined by an outside observer, is relatively meaningless unless the observer taps that individual's actual perceptions.

More specific to the HBM is the assumption that a person who believes he or she is in real danger of contracting a disease or health problem is more likely to take preventive measures than a person who believes he or she has only a moderate chance of contracting the disease or condition. Likewise, a person who believes that he or she has virtually no chance of contracting the condition will be the least likely to take preventive measures.

1.4.2 Perceived Seriousness

Perceived seriousness refers to the "degree of emotional arousal created by the thought of a disease" and "the kinds of difficulties the individual believes a given health condition will create for him" (Becker 1974:3). The difficulties inherent in various health conditions or diseases include death, reduction of mental and/or physical functioning over periods of time, or permanent disability. Perceived seriousness also includes beliefs about the effect of the condition on work, family, and social life (Becker 1974:3). If an individual believes that a certain condition is serious, he or she will be more likely to take preventive measures against that condition, than a person who believes that the condition will not have serious consequences.

According to the Health Belief Model (HBM), perceived susceptibility and perceived seriousness create a force for action. This force for action is a psychological state of readiness to engage in health behavior. Yet, this does not define the particular course of action to be taken. The choice of action to be taken is influenced by the individual's perceptions "regarding the relative effectiveness of known available alternatives in reducing the disease threat" (Becker 1974:4).

1.4.3 Perceived Benefits and Barriers to Action

Obviously, if there is no action that is seen as beneficial by the individual, there will be no action undertaken. To be perceived as beneficial, an action must be perceived as being effective in reducing susceptibility and/or seriousness of the disease. An action that is not perceived as being effective, will not be undertaken, even if it is effective in objective reality, as defined by scientific means. Likewise, health behaviors that have no objective value in scientific terms may be undertaken if they are believed by the individual to be effective.

Some health behaviors have inherent barriers for some people. For example, the physical unpleasantness of a diet may be a barrier to a person who is trying to lose weight. Other barriers may include such things as inconvenience, expense, or pain. The perceived benefits of a particular action minus the perceived barriers inherent in that action will determine the desirability of that action for a certain individual. The individual's relative strength of readiness to act combined with the relative desirability of a particular action will determine the likelihood of the individual undertaking that particular health action.

1.4.4 Cues to Action

Perceived susceptibility and seriousness provide the energy for action. Perceived benefits minus barriers provide a path of action. Yet, something may be needed to set the process in motion. This is called a "cue to action" in the Health Belief Model (HBM).

There are two basic types of cues to action. They are internal and external. The internal cue comes from within the individual. It is the individual's perception of his or her physical, psychological, or social state. Acting upon an internal cue is more characteristic of illness behavior than health behavior. By definition, illness behavior involves feeling ill and this feeling constitutes an internal cue.

External cues to action come from outside the individual. They include such things as mass media campaigns, advice from other people, reminder postcards from a dentist or physician, or an illness of a family member or friend (Becker 1974:7). The external cue to action is more characteristic of health behavior. The purpose of most of these external cues is to provoke action in people who feel healthy, which is a condition of health behavior.

The intensity of the cue required to trigger behavior depends upon the other variables (perceived seriousness and susceptibility, benefits minus costs of treatment). For ex-

ample, if an individual has a high perceived susceptibility and seriousness and has knowledge of an effective treatment with low costs, the cue to action need not be of high intensity to trigger behavior (Rosenstock 1966:101).

The operationalization of this concept and research regarding cues to action can be difficult. Individuals may not be aware of the specific cue that induced them to take action. The cues may also be cumulative. The individual may be exposed to several cues that increase the likelihood of action, until one cue finally causes the person to initiate a specific health behavior. This specific cue alone would not have been sufficient itself to spur the person to action without the cumulative effect of the previous cues.

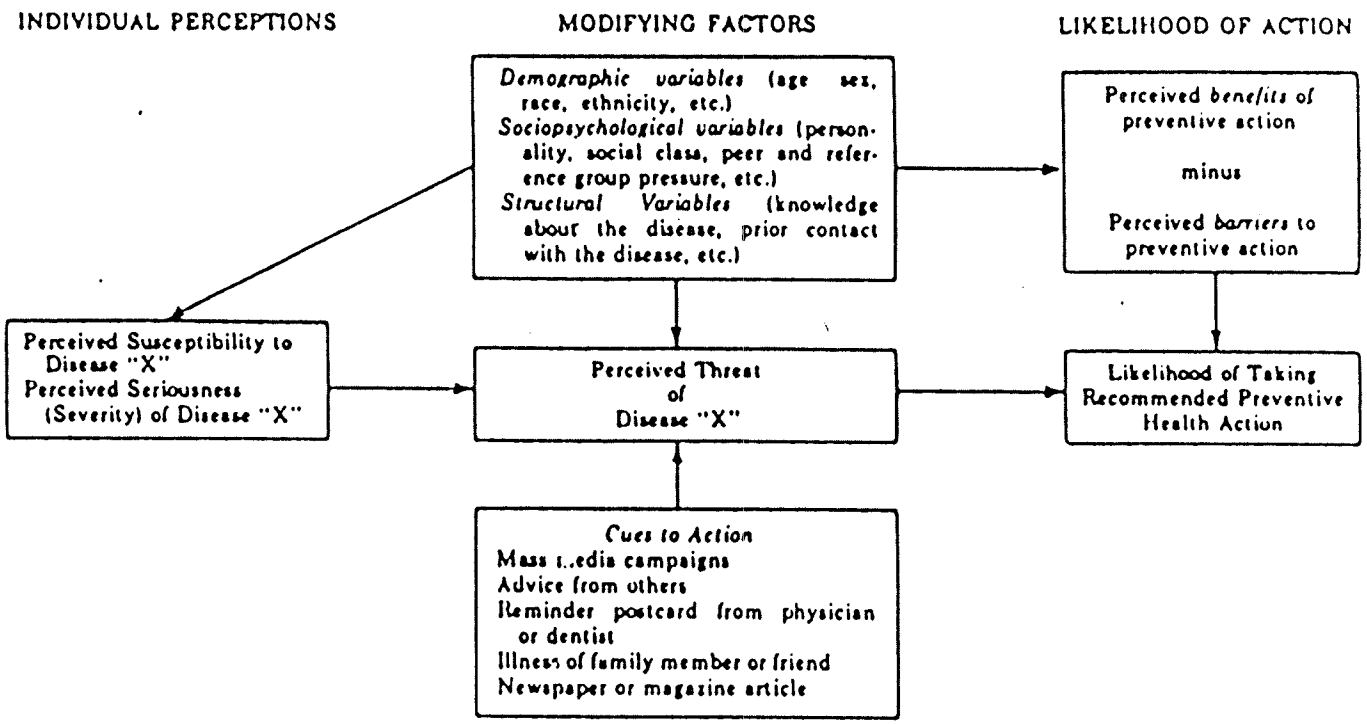
1.4.5 Other Modifying Factors

There are other factors which influence a person's health behavior. These include such things as demographic factors (eg. age, gender, race, ethnicity, and social class); sociopsychological attributes (eg. personality, peer and reference pressure); and knowledge or prior contact with the disease. These factors have a great deal of influence upon participation in health behavior, by their influence upon perceptions regarding health, illness, and proper behavior. For example, socioeconomic status factors have been shown to influence such health behaviors as preventive dental care, buying health insurance, getting a medical check-up, and immunizations (Koos, 1954. Suchman, 1965).

1.5 RELATIONSHIPS TO BE INVESTIGATED: THE CAUSAL MODEL

To engage in health behavior then, a person must perceive that he or she is healthy and be prepared to undertake health maintenance and illness prevention activities, in order to stay healthy. The primary purpose of health behavior is to prevent, not treat illness and disease. Although, detection of illness and disease is also partially a health behavior if the detection is at an asymptomatic stage. The Health Belief Model (HBM) thus incorporates both a maintenance, as well as a preventive orientation to health.

FIGURE 2: THE HEALTH BELIEF MODEL

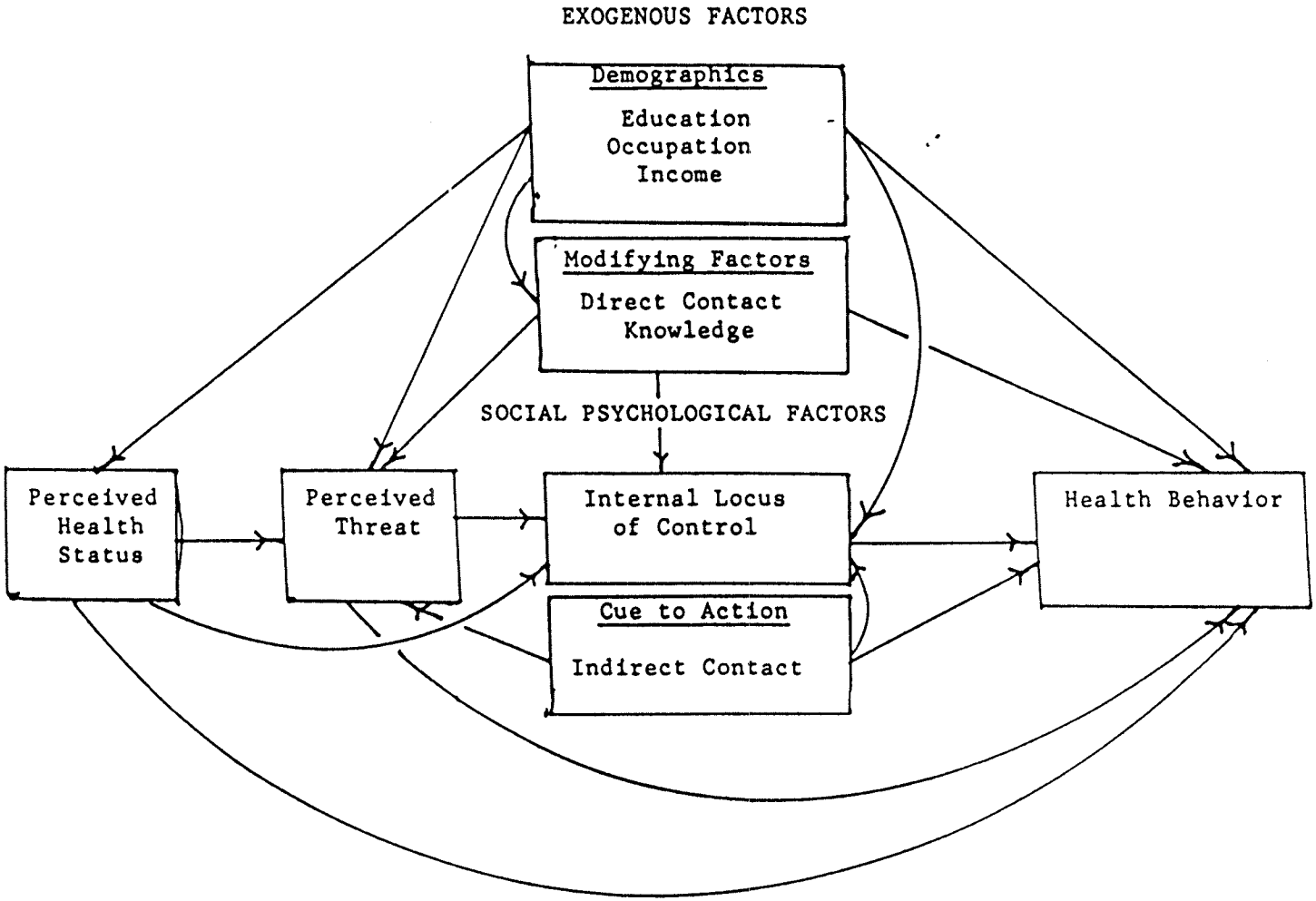


- from Becker (1974)

The HBM is represented in Figure 2. The model suggests a number of hypotheses about the relationships between its component parts. For example, the modifying factors will have an influence upon the individual's perceptions. Factors such as age, knowledge and prior contact with the disease will have an effect on the individual's perceptions regarding his or her susceptibility to the particular disease and also the perceived seriousness of that disease. These modifying factors also have an influence on the perceived benefits and barriers regarding preventive action.

According to the model, the perceived threat of a disease is determined by the modifying factors, the perceived susceptibility and severity of the disease, and cues to action. The behavioral outcome, which this model tries to predict, the likelihood of taking recommended preventive health action, is determined by the combined influence of perceived benefits and barriers of the action and the perceived threat of the disease.

FIGURE 3: MODIFIED HEALTH BELIEF MODEL



For this study, the HBM has been modified as illustrated in Figure 3. The limits of this project are such that only some of the relationships among the conceptual dimensions of the Health Belief Model (HBM) will be analyzed. To begin with, sociodemographic characteristics will be treated as exogenous variables. That is, they influence all the variables in the model. Knowledge about the disease and prior personal contact with the disease will be treated as mediating variables.

The demographic variables that will be studied are occupation, income, and education. The effect of these socioeconomic status factors on the other variables in the model will be a major aspect of this study. It was decided that these SES factors should be considered as demographic, rather than sociopsychological, as they were in the original Health Belief Model. Certain sociopsychological factors such as personality and peer pressure are difficult to measure and assess, in a mailed questionnaire, and have not been analyzed in the present study.

The modifying factors that will be considered are personal experience with heart disease and knowledge about heart disease. The separation of the demographic and modifying factors allows an examination of the relationships between the two sets of variables, as well as their combined impact on the other dimensions of the Health Belief Model. The di-

rect relationship between the modifying factors and health behavior will also be examined. The effect of the modifying factors upon the health behavior is only seen as indirect in the original model.

The social psychological variables that are included in the modified HBM are (1) perceived health status, (2) perceived threat, and (3) internal locus of control beliefs. Likelihood of action (i.e. perceived benefits and barriers) has been conceptualized in the modified model as internal locus of control. This is a measure of the relative power the individual feels he/she has upon his/her health. This concept has also been relocated in the modified model under social psychological factors because it is an individual perception. The relocation also allows for the influence of perceived threat upon internal locus of control to be analyzed.

Indirect contact with heart disease is included in the modified model as a cue to action. The original HBM defined prior contact with the disease as a structural modifying factor and the illness of a family member or friend as a cue to action. For this study, it was decided that indirect contact with heart disease should be considered as a cue to action. The effect of a direct relationship between cues to action and health behavior will also be examined. This relationship is not included in the original Health Belief Model.

The modified HBM is designed to explain, not predict health behavior. Therefore, it is not the likelihood of taking recommended preventive health action that will be investigated, but actual behavior. The specific preventive health action to be examined is smoking behavior. An attempt will be made to assess whether the model is able to explain the difference between those who have never smoked, those who have stopped smoking, and those who currently smoke.

The purpose of the HBM is seen as a "specification of several variables that appear to contribute significantly to an understanding of health behavior" (Rosenstock 1966:98). The HBM is not designed to provide a comprehensive explanation of all health action, but rather to link individual perceptions, modifying factors and cues to action with health behavior. In this study an attempt will be made to assess the applicability of the Health Belief Model to an understanding of cardiovascular health behavior and a specific preventive health action (i.e., being a non-smoker).

Chapter II

MEASURING HEALTH BEHAVIOR

2.1 EMPIRICAL PROBLEMS

There are empirical problems inherent in any research utilizing the Health Belief Model (HBM). Rosenstock (1966) presented a critique of the research guided by this conceptual model and identified eight basic points:

1. The use of different operationalizations of variables could mean that different concepts are being measured.

This is a valid concern in all social research. In the present study, questions that were seen as effective in measuring dimensions of the HBM in previous studies were used when possible.[4] Yet, caution must still be exercised when comparing the responses to different questions that are meant to measure the same concept.[5]

2. The level of readiness to act which precedes health behavior has not been quantified.

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[4] see section 2.2

[5] For example, Becker et al (1977) measured perceived susceptibility to certain conditions in children, by asking the mothers of the children how susceptible they believed the children were to the conditions.

Readiness to act is an elusive concept to measure. Studies that utilize this concept generally group responses into categories such as "high" and "low" (Rosenstock 1966:108). The analysis of different health behaviors may be partially responsible for problems in quantifying readiness to act (i.e., different levels of readiness may be necessary for different forms of health behavior). Researchers have not yet refined previously developed scales. In this study, readiness to act is conceptualized as a combination of perceived health status, perceived threat, and internal locus of control. This is consistent with much of the literature on the HBM. The degree to which an individual feels threatened by a disease, the relative amount of personal control the person perceives over his/her health, combined with the perceived health status will result in a certain level of likelihood to engage in a health behavior.

3. The perceptions of people may change over time.

The effect of changing perceptions on other concepts in the model cannot be determined by cross-sectional studies. Longitudinal studies do permit this analysis of change over time. Some research has used longitudinal analysis to measure change in one part of the Health Belief Model (HBM) when another part of the model is manipulated (Farquhar et al 1977, Puska et al 1979, Seeman and Seeman 1983). The present study is cross-sectional and therefore the effect of changing perceptions cannot be studied. This project will

only be able to analyze the effect of perceptions at one point in time.

4. The importance of perceived seriousness has not been demonstrated.

Rosenstock cites some previous research that has not found perceived seriousness to be a factor in determining health behavior.[6] Subsequent research has shown conflicting results. Some research has shown a positive relationship between perceived seriousness and health behavior (Becker et al 1977). Other research has discovered an inverse relationship between perceived seriousness and health behavior.

Overall, there is not a consensus on the effect of perceived seriousness. It is possible that perceived seriousness influences certain health behaviors and not others. It is also possible that there is an optimum level of perceived seriousness that will result in health behavior. An increase in perceived seriousness beyond this point may lessen the chances of health behavior. The creation of an interval level of measurement for perceived seriousness may be necessary to determine the optimal level, if it exists. A standardized measure would allow for consistency between studies. It would also be possible to ascertain what particular levels of perceived seriousness are most highly associated with certain health behaviors. Perceived seriousness of cardiovascular disease will be included in this study to

[6] for example, see Kegeles (1963)

find out if it has an effect on smoking behavior.

5. The HBM has no provision for knowledge about the genesis of beliefs.

The conditions under which health beliefs are acquired are not determined by the Health Belief Model. In order to isolate these conditions, the research must be longitudinal or rely on the respondent's recall. The use of respondent recall creates problems in validity as perceptions may be altered by time. The use of recall is particularly troublesome in trying to determine the genesis of health beliefs. The situations in which beliefs are generated may not be apparent to the respondent. The effect of family, peer, and social influences are often difficult to assess.

The present study makes no attempt to determine the origin of cardiovascular health beliefs. The questionable validity of such data and the limitations of the project, compared to the potential value of such knowledge, precluded the use of health belief origin questions. This study seeks to analyze the effects of current beliefs upon behavior. It was decided that the <u>content</u> of these beliefs was more important than their <u>origin</u> in explaining health behavior.

6. Beliefs may be modified.

Rosenstock cites some research that demonstrates that perceived threat may be altered by exposure to an anxiety producing stimulus related to a disease. Yet, the Health Be-

lief Model (HBM) does allow for this relationship. The effect of knowledge of the disease and contact with the disease upon perceived threat is part of the model. Perceived threat may also be directly influenced by demographic variables and cues to action. The modified Health Belief Model also includes the influence of perceived health status upon perceived threat.

This study will analyze the influence of various factors upon perceptions. Due to the cross-sectional nature of the data, it will not be possible to analyze changes in perceptions. The influence of modifying factors and individual perceptions, at one point in time, upon health behavior will be studied.

7. The HBM is not universal.

The Health Belief Model does not allow for some situations in which health behavior occurs. Rosenstock cites social pressure, legal compulsion, and job requirements as influences upon health behavior, not covered by the model.

These instances occur in varying degrees depending upon the particular health behavior. In the present study, the omission of social pressure as an indicator of smoking behavior is indeed a deficiency in the model.[7] To explain smoking behavior, social pressure should be included. Fu-

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[7] The nature of a mail survey is such that the accurate measurement of a concept such as social pressure to smoke is very difficult to obtain.

ture research in this area must find a way to incorporate social pressure in the model.

Legal compulsion may influence smoking behavior at certain times. For example, it will inhibit smoking in public places. It is not likely that these instances will have an appreciable effect upon overall smoking behavior. Few people will stop smoking because of a smoking ban in public places. The influence of job requirements is more likely to be a factor in such health behaviors as physical check-ups, rather than smoking behavior. Few occupations have regulations that will affect the person's overall status as a smoker, even if smoking is prohibited on the job. In such cases, people will probably still smoke when off the job.

Rosenstock also states that the Health Belief Model has greater applicability to the middle class than to lower status groups. This is seen as a result of the middle class orientation of planning for the future. The testing of this hypothesis will be a major focus of this study. The influence of occupation, income, and education upon smoking behavior will be analyzed.

8. The degree of association between two variables does not indicate which factor preceded the other in time.

This criticism of the data is due to the cross-sectional nature of most research using the Health Belief Model. Longitudinal or experimental research is needed to shed light

upon the chronological sequence of a relationship. Some researchers such as Farquhar et al (1977), Puska et al (1979), and Seeman and Seeman (1983) have used experimental research to determine the time sequence involved in some relationships in the model.

The data in this study are cross-sectional. It is therefore difficult to determine which of two associated factors preceded the other in time. Time and financial limitations prevented the use of any longitudinal or experimental research. Yet, cross-sectional data does have value in this area of research. These data will show the relative association of various factors in the Health Belief Model, including the particular health behavior that is examined (smoking behavior). The relative value of the concepts in the HBM and the model as a whole, in explaining smoking behavior will be investigated.

2.2 QUESTIONNAIRE CONSTRUCTION

Several questions were formulated on the basis of the literature concerning the Health Belief Model to facilitate testing of that model. For example, perceived susceptibility was operationalized by responses to questions regarding the likelihood of developing heart trouble, concern about heart trouble, and how frequently respondents thought about getting heart trouble.[8] (A more extensive explanation of the

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[8] questions #11-13 in Appendix B

measurement of the variables that were used in this study is given when particular hypotheses are discussed.)

Some other questions were developed in conjunction with the Manitoba Heart Foundation. The purpose of these questions was to test the model and to provide information for the Education Committee of the Foundation. Some of these questions were designed to help test the HBM by measuring knowledge about heart disease.[9] These questions gauged the respondent's knowledge of medical terms and general knowledge related to heart problems. Knowledge of heart disease is included in the model as a modifying factor.[10]

A measure of health locus of control beliefs was adapted from previous work (Wallston and Wallston 1980) and was included in this study.[11] Items in this scale were designed to measure beliefs in internal versus external ability to control the advent of illness. Five items pertaining specifically to control of heart disease were added. The items relating to internal and external locus of control, and heart

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[9] questions #4,5 in Appendix B

[10] Some of the questions that were designed to be used by the Education Committee of the Heart Foundation, do not measure concepts that appear in the theoretical model used with this study. These questions dealt with such things as the symptoms of a heart attack, emergency action, and the perceived role of the Heart Foundation. Information from the responses to these questions was gathered and presented to the Heart Foundation.

[11] question #3 Appendix B These measures have been used in other studies such as Seeman and Seeman (1983) and have shown validity and reliability.

disease were ordered in such a way as to lessen the chance of response set.

In the original Health Belief Model (HBM), the likelihood of action was conceptualized as perceived benefits minus perceived barriers to preventive action. For the present research, using the modified HBM, locus of control is used to measure likelihood of action. It was reasoned that the perceived amount of control the individual felt he/she had over his/her health would be an indicator of the likelihood of taking action. A person who feels he/she has a relatively high degree of control over his/her health is more likely to take action than a person who perceives little control over his/her health.

Questions on smoking behavior (the preventive health action explored in this study) were adapted from questions in the Canada Health Survey (1978).[12] Other questions derived from the Canada Health Survey (1978) were used to measure perceived health status, direct and indirect contact with heart disease, and health care utilization.[13]

Questions on health maintenance factors and physical activities were taken from the Canada Fitness Survey (1981).[14] A Blueprint for Core Social Indicators (1980) and Social

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[12] questions 21-26 in Appendix B

[13] questions 36-43 in Appendix B

[14] questions 28 and 29 in Appendix B

Concepts Directory (1980) were used to formulate questions regarding sociodemographic factors.[15] The use of standardized measures such as the Canada Health Survey should have increased the reliability of the data from this study.

2.3 PRETEST

A pretest was conducted on two groups of respondents in January, 1983. The first group consisted of thirty-six people training to become cardiopulminary resuscitation (CPR) instructors. It was argued that these people would be fairly knowledgeable about cardiovascular disease. The pretest was also administered to an introductory sociology class and a third year sociology of health care class, totaling fifty-eight persons. The sociology of health care class was assumed to have some knowledge of cardiovascular disease, while the introductory sociology class was assumed to have average knowledge of heart problems. In this way, the questionnaire was administered to a total of ninety-four individuals with different levels of knowledge about cardiovascular health.

The people participating in the pretest were asked to record starting time and finishing time on their questionnaire. This allowed for calculation of the time needed to complete the questionnaire. The mean completion time was 20 minutes.

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[15] questions 44-58 in Appendix B

The format of the questionnaire was altered somewhat by an analysis of questions that were not answered by the respondents. The variability of certain questions was checked by analyzing the number or responses for each response category. For example, if the responses to a certain question did not yield an acceptable level of variability, the response categories were restructured or the question was reworded or replaced.

Respondents were encouraged to write any comments they had about specific questions, and the format of the questionnaire in general. These comments, in addition to some oral comments, were recorded and analyzed. As a result of the pretest, some changes were made to the instrument. Instructions to respondents and the wording of some questions were clarified, and response categories were added to a few questions.

2.4 SAMPLING PROCEDURE

A probability proportionate to size sample of 1800 subjects was drawn from all Manitobans registered with the Manitoba Health Services Commission. The population was first stratified by age, gender, and geographic region and then random sampling was done within these categories. The sample was designed to include only people 20 years of age and older. Persons in prisons and mental institutions were excluded.

2.5 DATA COLLECTION PROCESS

It was determined that the most efficient method of obtaining the data would be a mail survey, since the sample was province wide. The Total Design Method for mail surveys as explained by Dillman (1978) was the basic system used to maximize response rate and usable data.

A printout of the sample was used to assign a respondent number to each person in the sample. The printout showed the age group, geographic region, and gender of each subject. The questionnaires were sent out to each person in the sample, along with a cover letter (Appendix C) and a stamped return envelope. This first mailing was on September 12, 1983.

A data set was created which included respondent number, region of the province, gender, and age group for each respondent. A variable was also created, and assigned a value of 0 until a questionnaire was returned. At that time the value was changed to 1 to show that the subject had completed and returned the questionnaire. Values were also assigned for persons who were unable to complete the questionnaire, for reasons such as the respondent being deceased, moved to another address without leaving a forwarding address, or lack of sufficient understanding of English. This variable made it possible to determine if there was any response bias by age, gender, or geographic region. The response rate will be reported in the following section.

On September 22, a reminder postcard was sent out to the 1423 people whose questionnaires had not yet been received. (Appendix D). Approximately two weeks after the card had been sent, (October 11) another questionnaire and cover letter (Appendix E) was sent to all 912 remaining non-respondents. On October 21 a second reminder postcard was sent to the 690 non-respondents.

2.6 RESPONSE RATE

A total of 1800 subjects were selected for the sample.[16] Of those selected, 146 were dropped from the sample due to an incorrect address, 32 were unable to answer the questionnaire due to physical, mental, or language problems, and 9 were deceased. These deletions left a sample of 1613 persons who presumably received the questionnaire and were capable of answering the questions. A total of 1034 completed questionnaires were returned, for a response rate of 64.1%.

2.7 DATA ANALYSIS

The responses to the questionnaires were coded and entered onto a computer program using SAS. Considerable time was spent cleaning the data and clearing up response, coding, and input errors. Crosstabs were run to determine the bivariate relationships between all the variables derived from

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[16] It was reasoned that, excluding refusals and people who could not respond to the questionnaire, that a total sample of 1800 would be needed to assure a representative sample of all Manitobans.

the Health Belief Model (HBM) for testing. For example, relationships were examined between exogenous variables, intervening variables, social psychological variables, cues to action, and health behavior. Regression was also used for multivariate analysis of various aspects of the model. The analysis sought to determine the degree to which the selected variables in the Health Belief Model were related to health behavior (and to each other). Specific hypotheses regarding these relationships were generated and tested. More information regarding the operationalization of variables and the actual hypotheses tested will be presented in the following chapters.

Chapter III

CARDIOVASCULAR HEALTH BEHAVIOR: SOME DESCRIPTIVE INFORMATION

3.1 SOCIODEMOGRAPHIC PROFILE

The 1034 people who responded to the questionnaire were fairly representative of all Manitobans on several sociodemographic characteristics. The 1981 Census revealed 506,510 males and 519,730 females in Manitoba for a total population of 1,026,240.[17] These figures yield a ratio of 49.4% male and 50.6% female. Of the 1034 respondents, 1022 reported their gender. A total of 546 females and 476 males were included in the sample. This represents a sample containing 53.4% female and 46.6% male. Females were thus slightly over represented in the final sample.

Table 1 shows the percentage of people within the province in each age category and the percentage of people within the sample in each age category. (20 people in the sample did not respond to the question regarding age.)[18]

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[17] All provincial figures cited in this section are from 1981 Census of Canada Population, Age, Sex, and Marital Status Catalogue 92-901 (Volume 1), Ottawa:Statistics Canada, Sept. 1982

[18] Percentages are based upon the population 20 years of age and older, since the sampling frame was based upon people 20 years and older.

TABLE 1

Distribution of the Population and Sample by Age

Age group	Population		Sample	
	N	%	N	%
20-29	180,350	26.1	263	25.9
30-39	140,485	20.3	195	19.2
40-49	100,605	14.5	159	15.7
50-59	102,315	14.8	149	14.7
60-69	88,185	12.7	140	13.8
70+	79,805	11.5	108	10.7
Totals	691,745	99.9	1014	100.0

As can be seen from this table, the sample is fairly representative of age distribution in the provincial population. There is a slightly higher proportion of the 60-69 and the 40-49 age group in the sample, than in the province and a slightly lower proportion in the 70+ age group. However, these differences are slight and the sample is clearly representative of the province by age. Table 2 shows the number of people in the province for each geographic region, and the number of respondents from each of these regions.[19] This table indicates that Northern Manitoba is slightly under represented in the sample. Nevertheless, the overall sample can be considered representative of the population of Manitoba by geographic region.

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[19] These geographic regions were determined by the Manitoba Health Services Commission and are used by the province for administering health and community services. The figures for the province are based on Manitoba Health Services Commission figures for 1984. These figures represent people of all ages, while the sample is composed of people 20 and older. The geographic region of one respondent was impossible to determine due to a mistake in assigning respondent numbers.

TABLE 2

Distribution of Population and Sample by Region

	Population		Sample	
	N	%	N	%
Central	92,395	8.4	80	7.7
Eastman	78,569	7.2	65	6.3
Interlake	69,716	6.3	61	5.9
Norman	76,164	6.9	44	4.3
Parkland	50,467	4.6	51	4.9
Westman	121,061	11.0	126	12.2
Winnipeg	610,391	55.6	606	58.7
Totals	1,098,763	100.0	1033	100.0

TABLE 3

Distribution of Population and Sample by Education

	Population		Sample	
	N	%	N	%
Jr. Hi or less	169,360	21.5	216	21.3
10-12 years	337,905	43.0	345	34.1
Tech/Voc	154,485	19.7	187	18.5
some University	124,200	15.8	264	26.1
Totals	785,950	100.0	1012	100.0

TABLE 4

Distribution of Population and Sample by Income

	Population		Sample	
	N	%	N	%
less than $10,000	90,530	25.3	130	15.4
$10,000-19,999	99,010	27.7	276	32.7
$20,000-29,999	83,300	23.3	198	23.5
$30,000-39,999	47,290	13.2	104	12.3
$40,000+	37,855	10.6	136	16.1
Totals	357,985	100.1	844	100.0

Table 3 and Table 4 show the educational and income levels of the sample compared to the population of the prov-

ince.[20] The figures given for Manitoba are for people 15 years and older, while the sample includes only people 20 years and older. It is to be expected that the people included in the Manitoba figures and not in the sample figures (15-19 years) will mainly be in the two lower educational levels. Due to the fact that the Manitoba and the sample populations begin at different ages, it is difficult to make a conclusive statement about the representativeness of the sample by education. Yet, the figures do seem to indicate that, other than an over representation by people with some university training, the sample is fairly representative of the general population.

Table 4 shows the total annual family income of the respondents and the population of Manitoba.[21] This table indicates that the $10,000- 19,000 and the $40,000+ categories are over-represented in the sample. In contrast, individuals with an annual income under $10,000 are under-represented in the sample. The remaining categories contain appropriate numbers of people to be representative of the province. Overall, the income distribution in the sample would seem to be slightly higher than the province as a whole.

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[20] The figures for Manitobans in these tables were taken from 1981 Census of Canada catalogue 95-942 (vol. 3-profile series B)

[21] Ninety-one of the respondents indicated that they did not know their annual family income and ninety-nine people did not respond to the question on income.

Table 5 contains information regarding the marital status of the sample and the province as a whole. The sample contains a much lower percentage of single people. This is due, in part, to the difference in minimum age for inclusion in the two sets of figures. Once again, the Census begins at 15 years and the sample at 20 years. This could explain a portion of the difference in the percentage of widowed, separated, and divorced people. Excluding the 15-19 year age group would result in a higher portion of people widowed, separated, and divorced. This may explain some of the difference between the sample and the population, but it is not likely that all of the difference is due to different inclusion criteria.

TABLE 5

Distribution of Population and Sample by Marital Status

	Population		Sample	
	N	%	N	%
Married/Common Law	478,260	46.6	500	49.1
Widowed	55,905	5.4	175	17.2
Separated/Divorced	38,460	3.7	104	10.2
Single	453,615	44.2	240	23.6
Totals	1,026,240	100.0	1019	100.0

3.2 SOCIOMEDICAL CHARACTERISTICS RELATING TO HEART DISEASE

Almost nine and one-half percent of the respondents reported that they had experienced heart trouble at some point in their lives, while 24.2% reported having had high blood pressure. A father who had heart trouble was reported by 33.2%, and a mother who had experienced heart trouble was reported by 20.9% of the respondents. Just over half (54.3%) reported having another member of their immediate family or a close friend who had heart trouble at some point. Overall, combining the figures, 65.2% of the respondents had either a parent, other immediate family member, or close friend who had heart trouble at some time. While a small proportion of the respondents have directly experienced heart trouble themselves, approximately two-thirds have had contact with cardiovascular health problems through a member of their social network.

3.3 LEVEL OF KNOWLEDGE ABOUT HEART DISEASE

The questionnaire was designed to determine the level of knowledge about heart disease among the respondents.[22] The respondents were first asked to pick the terms which refer to heart problems from a series of medical terms. A list of eight terms was presented to the respondents. Five of these terms referred to different types of heart disease (eg.

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[22] Knowledge levels were measured by question 4 (types of heart disease); question 5 (etiology, symptomatology and treatment of heart disease); and question 19 (risk factors). See Appendix B.

angina, atherosclerosis), while the other three terms referred to various health problems (eg. cholecystitis). The data were then analyzed according to how many terms the respondent correctly identified as being associated with heart disease, how many were identified incorrectly, and how many were answered "don't know".

Table 6 indicates that the sample is not very familiar with these medical terms. Only 17.8% responded correctly to 6 or more items. The median score was 3 correct items. The sample generally did not answer incorrectly, but were more likely to give a response of "don't know".

TABLE 6

Knowledge of Different Types of Heart Disease

Medical Terms	Correct		Incorrect		Don't Know	
	N	%	N	%	N	%
0	240	23.2	418	40.4	311	30.1
1	74	7.2	335	32.4	115	11.1
2	124	12.0	202	19.5	125	12.1
3	144	13.9	64	6.2	115	11.1
4	144	13.9	12	1.2	112	10.8
5	124	12.0	3	.3	68	6.6
6	88	8.5	0	0.0	60	5.8
7	64	6.2	0	0.0	58	5.6
8	32	3.1	0	0.0	70	6.8
Totals	1034	100.0	1034	100.0	1034	100.0

Another question was designed to determine the respondents' general knowledge regarding heart disease.[23] Table

[23] Six statements regarding heart problems were listed. The respondents were asked to indicate if the items were true or false. Half of the items are considered to be true (eg. Heart disease is hereditary). The other three items

7 summarizes the results of this question. A comparison of the two tables shows that although the respondents may not be familiar with all of the medical terms, they do have a fairly good general knowledge about heart disease. Nearly 77% of the sample had 4 or more items correct. The median score was 5 correct items. There were few items that were answered incorrectly. Eighty-two percent of the sample had 1 or 0 incorrect responses. The "don't know" responses were also low. Over 83% of the respondents indicated that they "don't know" the answer to 1 item or no items.

TABLE 7

General Knowledge Regarding Heart Disease

Statements	Correct		Incorrect		Don't Know	
	N	%	N	%	N	%
0	45	4.4	503	48.6	567	54.8
1	26	2.5	345	33.4	293	28.3
2	54	5.2	127	12.3	103	10.0
3	114	11.0	47	4.5	44	4.3
4	244	23.6	11	1.1	20	1.9
5	337	32.6	1	.1	5	.5
6	214	20.7	0	0.0	2	.2
Totals	1034	100.0	1034	100.0	1034	100.0

A question was also included to determine the respondents' beliefs regarding various factors that may increase a person's chances of experiencing heart disease. Table 8 shows the results of this question. Overall, the sample demonstrates fairly accurate perceptions regarding risk

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are false (eg. Most heart attacks are fatal). Response categories of true, false, and don't know were provided (see question 5 Appendix B).

factors associated with heart disease. The medical profession generally considers elevated blood pressure, being overweight, anxiety or tension, and smoking cigarettes as the most influential factors in acquiring heart problems. These were the factors most often chosen as very important by the respondents. The knowledge about heart disease risk factors shown in Table 8 combined with the high scores on the general knowledge questions presented in Table 7 indicate that the respondents in the sample are quite knowledgable about heart disease.

TABLE 8

Perceived Importance of Risk Factors

	Very Important		Somewhat Important		Not Important		Don't Know	
	N	%	N	%	N	%	N	%
A family history of heart problems	554	54.3	406	39.8	39	3.8	21	2.1
Smoking cigarettes	624	60.9	341	33.3	40	3.9	19	1.9
Elevated blood pressure	738	72.5	243	23.9	14	1.4	23	2.3
High cholesterol diet	603	59.4	328	32.3	26	2.6	59	5.8
Drinking coffee	105	10.4	485	48.0	333	32.9	88	8.7
Being of the male sex	96	9.6	366	36.4	395	39.3	148	14.7
Being overweight	706	68.9	301	29.4	6	.6	12	1.2
A lack of exercise	536	52.6	442	43.4	25	2.5	16	1.6
A stressful job	594	58.2	381	37.3	27	2.6	19	1.9
Anxiety and tension	632	61.7	354	34.6	15	1.5	23	2.2

3.4 SMOKING AS BEHAVIOR

For this study, smoking behavior was chosen as the health behavior to be analyzed. Smoking has been shown to be related to several health problems, including heart disease. Avoiding smoking is generally recognized as a health behavior.[24]

Horn (in Borgatta and Evans [1968]) states that smoking is a form of "gratification behavior". For smoking, though, the gratification behavior is likely to harm the individual. This is the basic conflict in the smoking decision.

To understand this conflict and the decision regarding smoking, Horn lists four concepts that need to be examined:

1. Motivation

   Usually the motivation to stop or cut down smoking is because of health concerns. It is almost universally accepted that smoking is linked to heart disease, lung disease, and other health problems. Yet, there may be other motivations to stop smoking. Parents, teachers, athletic coaches, and other role models may not smoke. The financial cost of cigarettes, and repairs to burnt furniture and clothes may influence the smoking decision. Some people may not smoke because their environment is more pleasant

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[24] In this survey, 69% of the respondents identified avoiding smoking as a very important factor in maintaining overall health; and a further 25.1% perceived avoiding smoking as somewhat important.

without smoke. For example, food may taste better and the air is cleaner. Giving in to smoking may also produce feelings of guilt, inadequacy, or lack of self-control. The person who stops smoking is more likely to feel a sense of mastery over his/her life.

2. Perception of the Threat of the Disease

The perception of the threat of the disease is shaped by four conditions. These conditions are (a) an awareness of the threat, (b) an acceptance of the threat, (c) the relevance of the threat to the individual, and (d) the person's perceived susceptibility to the particular threat.

3. Development and use of Alternative Psychological Mechanisms

Smoking can be learned to "relieve any negative affect or to evoke any positive affect" (Horn in Borgatta and Evans [1968]:17). For some people smoking is used for stimulation or relaxation, which is seen as positive affect. Negative affects related to smoking include relief of tension, and feelings of distress. Therefore any smoking cessation program must have the ability to satisfy these psychological conditions.

4. Factors Facilitating or Inhibiting Continuing Reinforcement

> Smoking cessation is seen as a process, instead of a single event. Many factors involving social and structural forces influence this process.[25] To stop smoking, the person must understand these forces as well as the psychological mechanisms smoking produces.

A study by Borgatta and Evans (1968) sought to analyze the relationship between various social and psychological patterns and smoking behavior among a group of university students. They found that a change in lifestyle may often accompany a change in smoking behavior. For example, they cite an increase in stress brought about by increased role strain of women with jobs outside the home, as being responsible for increased smoking rates of women. A large number of other social and psychological traits were found to be related to smoking behavior.[26]

Mettlin (1973) states that the reason for lack of success by medical programs to aid in smoking cessation is that smoking behavior is a non- medical decision. A theoretical

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[25] Peer pressure and stress are examples of these social and structural forces.

[26] Some of these traits were work orientation, freedom from social restraint, popularity with opposite sex, participation in athletics, standing in high school class, amount of time studying, amount of time socializing, drinking beer or hard liquor, perceived threat of smoking related disease, having friends involved in smoking marijuana, drinking alcoholic beverages, or sexual activity. The perceived pleasure of cigarettes was the factor most highly correlated with smoking behavior.

model that attempts to analyze smoking behavior must employ a conceptualization that is broad enough to apply to the analysis of smoking initiation, continuation, and cessation. Each of these processes are different. Different social, structural, and psychological forces influence a person in each process. Therefore, the model must contain many different independent variables to reflect these forces.

Mettlin (1973) has attempted to create a model to predict smoking behavior with these criteria in mind. The dependent variable was the number of cigarettes smoked daily. (In this operationalization a respondent going from no cigarettes to any number was seen as initiating smoking behavior. Smoking continuation and cessation could also be measured.)

The independent variables were diverse. The person's self image as a smoker was seen as a causal influence. For example, a person may want to quit smoking, yet perceives himself as a "pack a day man".[27] Other related attitudes in the model included the perceived threat of disease, pleasure of smoking, the inconvenience and cost of smoking. The influence of significant others was also included as an independent variable.

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[27] In another study, nearly half of a group of people that had never tried to stop smoking, stated that they would quit, "if there was an easy way to do it". (Graham and Gibson 1971:324)

The individual's own experience with smoking was also included. This variable accounted for things such as respiratory reactions to smoking. Structural factors such as age and being in places where smoking is prohibited was measured as was exposure to and acceptance of various mass media messages related to smoking.

A test of this model explained 66% of the variance in smoking behavior. The success of the model was interpreted to be a result of seeing smoking behavior as dependent on interpersonal, social, and structural influences, rather than a strict physical dependence upon a drug. (Mettlin 1973)

Smoking behavior is clearly not based upon a single causal relationship. There are many factors that influence the smoking decision. The main goal of this particular research was to discover whether smoking behavior can be explained by the concepts in the Health Belief Model.

All respondents were asked to describe their experience with tobacco. Their responses were used to separate the respondents into three groups: (1) people who currently smoke; (2) people who have stopped smoking; and (3) people who have never smoked. The people in the last two groups (i.e. ex-smokers and people who have never smoked) are seen as people who have undertaken a health behavior. These people have exhibited a behavior designed to help maintain

TABLE 9

Smoking Behavior of Canadians and Respondents

	Smokers	Ex-Smokers	Never Smoked
Canada (1978)	43.6	25.2	31.2
Manitoba (1983)	40.6	28.5	30.8

TABLE 10

Female and Male Smoking Behavior

Female Smoking Behavior

	Smokers	Ex-Smokers	Never Smoked
Canada (1978)	39.6	19.5	40.9
Manitoba (1983)	40.7	21.7	37.6

Male Smoking Behavior

	Smokers	Ex-Smokers	Never Smoked
Canada (1978)	46.8	28.6	24.5
Manitoba (1983)	40.9	36.4	22.7

their health and/or to avoid illness. The smoking behavior of the respondents is close to the rate of smoking among the Canadian population reported in the Canada Health Survey (1978). After eliminating the 15-19 year olds, so that both surveys are based on the same age groups (20+), the figures are shown in Table 9.

The breakdown of the samples by gender is in Table 10. It is difficult to make accurate comparisons between the Manitoba and Canada data for smokers by gender. The Canadian sample begins at age 15 and the Manitoba sample begins at

age 20.[28] There is also a time differential of five years, during which smoking behavior may have changed. Nevertheless, the figures for both sets of data are relatively close. The only groups that differ to any extent are male smokers and ex-smokers. The Manitoba data show fewer male smokers than the Canada data, and more ex-smokers.

The influence of several other demographics upon smoking behavior was analyzed.[29] An inverse relationship exists between age and smoking for the sample. The number of smokers generally decreases in the higher age groups, while the number of people who have never smoked generally increases.

People who are widowed are the least likely to be smokers (28.6%) and the most likely to have never smoked (44.6%). This is likely a spurious relationship. This group of people (widowed) are generally older, which means they are less likely to be smokers. Divorced and separated people are the most likely to be current smokers, which is probably due to stress.

As would be expected, the unemployed were the occupational status with the highest rate of smokers (58.3%). The unemployed were also the least likely to have never smoked (26.7%). These people probably feel the most stress of any

[28] The data for smoking by gender is not broken down into 5 year groups, as is the overall smoking behavior data.

[29] They included sociodemographic factors such as age, marital status, employment status, country of birth, ethnic identity, and religion.

of the employment status groups.

The two employment status groups with the lowest rate of smokers were students (25.9%) and retired (26.4%). The low rate for retired people is to be expected because of the inverse relationship between smoking and age. The low rate for students, though, is unexpected, if age was the only factor involved. The age group 20-24, which likely includes the majority of students in the sample has a smoking rate of 55.2%. The influence of factors, such as education and SES are probably responsible for the low smoking rate among students.

The employment status groups with the greatest number of people who have never smoked are part-time (45.1%) and people who keep house (45.6%). The large proportion of women in these classifications is probably responsible for the high proportion of people who have never smoked.

Canadian-born people were found to be more likely to smoke (42.5%) than people born outside Canada (31.0%). People who perceived themselves as members of a particular ethnic group were less likely to be a current smoker (37.2%) than people who did not see themselves as members of an ethnic group (42.2%).[30] The particular ethnic groups that had the highest rate of smokers were Native North American/Metis (80.0%) and British (70.0%), although the total numbers in

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[30] includes "Canadian"

these groups was small.[31] The groups with the lowest proportion of current smokers were Eastern Europeans (28.1%), Jewish (28.6%), and Western Europeans (30.0%).[32]

The religious groups with the lowest rate of current smokers were Jehovah's Witness (20.0%), Greek Orthodox (22.2%), and Mennonite (22.9%). The groups with the highest rate of smokers were Presbyterian (66.7%), no religious preference (58.0%), and Pentecostal (53.8%). The high rate of smokers amongst Pentecostal groups is surprising, because smoking is usually viewed as morally wrong according to church doctrine. Members of Pentecostal churches are usually from lower SES groups, so that could partially explain this relationship. The Presbyterian church has no stated policy on smoking. It is usually left up to the individual congregation to make a decision on smoking. These findings must be interpreted cautiously, however, as the number of members of these religious groups in the sample was small (eg. Presbyterians N=18 and Pentecostals N=13).

The relationships between smoking and various demographic characteristics support the notion that smoking behavior is influenced by non-physical forces. Indeed, social and structural forces play an important part in the smoking decision and in patterning smoking behavior.

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[31] 15 Native/Metis and 10 British

[32] The sample for Jews was quite small (N=7).

Chapter IV

THE IMPACT OF SOCIAL PSYCHOLOGICAL FACTORS ON HEALTH BEHAVIOR

4.1 INTRODUCTION

According to the Health Belief Model, health behavior can be understood as the outcome of the interaction of a complex set of factors. Social psychological factors (individual perceptions) provide a force for action (perceived threat) and define a likely course of action (perceived benefits-perceived barriers). These social psychological factors in turn are influenced by modifying factors (eg., knowledge about the disease) and cues to action (eg., contact with someone who has had the disease) to set behavior in motion.[33] Finally, all these dimensions are affected by exogenous factors (eg., demographics such as level of education, occupation, and income).

Hypotheses have been formulated to guide the empirical investigation of selected sets of relationships among the various dimensions of the Health Belief Model, and the overall relationships between all factors in the model. For example, the relationships among the social psychological factors (i.e., perceived health status, threat, internal locus

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[33] see Figure 3

of control) will be investigated first, and then the cumulative affect of these factors upon smoking behavior will be examined. Hypotheses testing and the presentation of findings will be handled in this chapter and the following three chapters. The present chapter will focus on the impact of social psychological factors on health behavior. The next two chapters will examine the relationships between modifying factors, cues to action, and both the social psychological dimensions of the model and health behavior (i.e., smoking). Finally, Chapter Seven will examine the impact of socioeconomic factors on the other dimensions of the Health Belief Model. More specifically, the relationships between SES (i.e., education, occupation, income) and social psychological factors, modifying factors, cues to action and smoking behavior will be analyzed in this chapter.

4.2 PERCEIVED HEALTH STATUS, PERCEIVED THREAT, AND INTERNAL LOCUS OF CONTROL

Previous research using the concepts of the Health Belief Model has assumed relationships exist between the social psychological factors, without testing them. An inverse relationship between perceived health status and perceived threat is implied by the HBM, but has not been examined by researchers. It does have face validity as it seems logical to assume that a more positive perceived health status will be associated with lower levels of perceived susceptibility to illness. However the causal sequence is difficult to de-

termine. While a positive perceived health status could lead to lower perceived susceptibility to disease, just the opposite is equally possible. This study will focus on the relationship between perceived health status and susceptibility to a particular health problem, namely heart disease.

The relationship between perceived health status and internal locus of control is implied by the HBM but is not well documented in the literature. The hypothesis itself has never been explicitly stated or empirically tested. For example, while Seeman and Seeman (1983) mention that a sense of control was found to be associated with higher self ratings on general health status, they offer no discussion or explanation.

A relationship between perceived threat and internal locus of control also has face validity. It seems logical to assume that a person who feels threatened by diseases such as heart trouble will probably believe that he/she has little internal control over the onset of disease. The relationship between perceived threat and internal locus of control has never been examined. The original Health Belief Model does not indicate that this relationship exists. Yet, Gochman (1971) states that this inverse relationship exists "among persons for whom health is salient" (Gochman 1971:150).

4.2.1 Statement of Hypotheses

The specific hypotheses regarding the social psychological factors to be investigated are:

1. Perceived health status is inversely related to perceived threat.
2. Perceived health status is directly related to an internal locus of control.
3. Perceived threat is inversely related to an internal locus of control.

4.2.2 Operationalization of Social Psychological Variables

Perceived health status was measured by asking respondents to describe: (1) their present state of health; and (2) their health over the past 12 months.[34] It was decided for this analysis to use responses to the question on health over the past 12 months as the empirical indicator of perceived health status. Reported health over the past 12 months subsumes reported health over the previous 2 weeks. Furthermore, calculating perceived health status over 12 months also allows the respondent to consider fluctuations in health over a longer period of time. Finally, this measure of health status was selected because the questions on smoking behavior also focused on the same time period (i.e., the preceding year).

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[34] See questions 38 and 39 Appendix B. The correlation coefficient for responses to these two questions was .34, with a p value of .0001.

Respondents were asked to describe their health over the past twelve months by choosing the appropriate response on a five point scale ranging from "very healthy" (5) to "unhealthy" (1). Eighteen percent of the people gave a response of 5 (very healthy), 34% picked response category 4, 32% picked the midpoint of the scale, 13% chose category 2, and 4% gave the response of 1 (unhealthy).

In the Health Belief Model, perceived threat is seen as a combination of perceived susceptibility and perceived seriousness. The more susceptible a person feels to a disease, the more threatened he or she will feel by that disease. Similarly, the person will feel more anxiety if the disease is perceived to be serious. Perceived seriousness was measured by questions about pain, disability, and the chance of death associated with heart problems.[35] The data from question 6 showed that 5.6% of the respondents felt that heart problems generally cause very little pain, 61.7% some pain, and 32.7% extreme pain. The responses to question 7, regarding the amount of disability generally associated with heart disease, showed little variability. The vast majority of respondents (77%) believed that heart problems usually result in temporary disability, while 8.2% responded that heart problems generally cause no disability, and 14.9% permanent disability. The data regarding the likelihood of death from heart problems showed even less variability.

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[35] questions 6-8 in Appendix B

Only 1.5% of the sample reported that heart disease rarely results in death. A belief that heart disease sometimes results in death was reported by 81.5%, while 16.9% stated that heart disease usually results in death. Therefore perceived seriousness was omitted from the analysis because it was found to be a constant.

Perceived susceptibility was measured by responses to three questions.[36] Respondents who reported that they had had heart problems at some point in their lives were eliminated from this analysis of perceived susceptibility.[37] The responses were measured on a 5 point scale ranging from very likely or frequently (5) to very unlikely or never (1). Five was interpreted as "high" perceived susceptibility and 1 as "low". Scores on each of the three questions were then combined to yield a composite score for perceived susceptibility. This score included perceptions regarding the likelihood of developing heart disease, concern about developing heart disease, and how frequently the respondent thought about getting heart disease. The values for the scale ranged from a minimum of 3 to a maximum of 15. Table 11 shows the frequency distribution for perceived susceptibility.

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[36] Questions 11-13 in Appendix B.

[37] See question 40 in appendix B.

TABLE 11

Distribution of Perceived Susceptibility

	N	%
3	55	6.1
4	39	4.3
5	59	6.6
6	86	9.6
7	112	12.5
8	133	14.8
9	139	15.5
10	73	8.1
11	86	9.6
12	53	5.9
13	36	4.0
14	16	1.8
15	12	1.3
TOTALS	899	100.1

4.2.3 Operationalization of Locus of Control

The items chosen for the measurement of locus of control were adapted from previous research (Lau [1982] and Wallston and Wallston [1980]). Lau (1982) tested a multidimensional health locus of control scale that was based on previous work. Three major factors emerged. They were (a) self control over health (b) provider control over health, and (c) chance health outcomes (Lau 1982:326). These dimensions were similar to three dimensions defined by Wallston as (a) internal (b) powerful other, and (c) chance (Lau 1982:323).

Twenty items were included in the present study to measure these three dimensions of health locus of control: (a) internal, (b) external provider, and (c) external chance.[38]

[38] Five additional items were also designed to gauge the respondents' views about the ability of the individual to

Responses to these items (question 3 in Appendix B) were factor analyzed and two distinct loadings emerged. The loadings showed that the external chance and internal locus of control items could be used to create two separate subscales. The internal subscale was chosen for inclusion in this study as the locus of control measure. It was reasoned that internal control was more relevant to this study due to the nature of the behavior being analyzed. The items that loaded together for the internal subscale tended to relate to preventive behavior and a belief in the individual's ability to maintain health and avoid illness.[39]

A parallel could be drawn between the internal preventive items in this study and Seeman and Seeman's (1983) "personal mastery" scale. In addition, the external chance items are similar to "luck denial" in the Seeman and Seeman study. In that study it was determined that the personal mastery items were associated with health behavior, while the luck denial items were associated with illness behavior. The present study was designed to analyze health behavior and, therefore the internal preventive scale was used to operationalize locus of control. Responses to the three items were grouped

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control heart disease. However, factor analysis did not reveal a scale for these particular items and they were not used in the subsequent analysis.

[39] The items included in the internal subscale were "People who take care of themselves stay healthy," " Whenever I get sick it is because of something I've done or not done," and "If I take care of myself, I can avoid illness."

by level of agreement (agree, undecided, and disagree). Values were assigned to the responses, with those representing higher levels of internal locus of control given higher values. Agreement with the statements was assigned a value of 3, undecided was given a value of 2 and disagreement with the items was scored 1. The values for the three items were then added to give a single scale score for each respondent on this measure of internal locus of control.

4.2.4 Findings and Discussion

Crosstabulations between the social psychological variables yielded tables that contained many cells with low frequencies. These low cell frequencies meant that the chi-square values were questionnable. Therefore the variables were collapsed.

The values for perceived susceptibility were grouped into "high, medium, and low". Low perceived susceptibility was defined as values between 3 and 6. The boundaries for low perceived susceptibility insured that no person in this group could have given a response of maximum susceptibility on any of the three questions. It also meant that virtually all of the responses were on the low end of the perceived susceptibility scale for each question. Medium perceived susceptibility was defined as values between 7 and 11. These cut-off points meant that the responses to the questions were in the middle range, or were a combination of

"high" and "low" responses. Values between 12 and 15 were interpreted as high perceived susceptibility. The people included in this category could not have answered any of the questions with the minimum perceived susceptibility response and were likely to respond to all of the questions with a relatively high susceptibility score. Table 12 shows the distribution of the scores on the perceived susceptibility scale.

TABLE 12

Levels of Perceived Susceptibility

	N	%
High	116	13.0
Medium	541	60.7
Low	234	26.3
Totals	891	100.0

To collapse the perceived health status scores responses 1 and 2 were combined into a category called "unhealthy". Response 3 was considered "moderate" or undecided, and responses 4 and 5 were considered "healthy" By this operationalization, 17.1% of the sample was classified unhealthy, 31.5% moderate, and 51.4% healthy.

The scale scores for internal locus of control were then separated into low, medium, and high. Scores of 8 and 9 were labelled as "high", scores between 5 and 7 as "medium",

and scores of 3 and 4 as "low".[40] By this operationalization, 29.5% of the sample was found to have a high level of internal locus of control, 59.1% had a moderate level, and 11.4% had a low level.

Table 13 shows the results of crosstabulations of perceived health status and perceived susceptibility. There does seem to be an overall inverse relationship between these variables (as indicated by the negative values for gamma and Tau-b), but the relationship is not linear. The inverse relationship holds (by column) for low and medium categories of perceived susceptibility, but not for high susceptibility. For example, among people who were classified as having a high level of perceived susceptibility, there were more who saw themselves as healthy (29.9%) than unhealthy (23.9%), but the largest group was the "moderately" healthy (46.2%). Similarly, by row, the moderate health status had the greatest proportion of people with high perceived susceptibility (20.8%) when compared to the unhealthy group (18.4%) or the healthy group (7.3%). It does seem that respondents in the healthy group have a lower level of perceived susceptibility than the other two groups. However, it also seems that the moderately healthy group (i.e. those who may be uncertain of their health status) may per-

[40] By this categorization, the people labelled as having a high level of locus of control responded to at least two of the three items with the maximum internal control response. The people in the "low" group reported the minimum internal control response to at least two of the three items.

TABLE 13

PERCEIVED SUSCEPTIBILITY BY PERCEIVED HEALTH STATUS

COL %

ROW %

PERCEIVED SUSCEPTIBILITY	PERCEIVED HEALTH STATUS: UNHEALTHY	MODERATE	HEALTHY	
LOW	40	53	141	234
	26.3	20.5	29.4	26.3
	17.1	22.6	60.3	
MEDIUM	84	152	304	540
	55.3	58.7	63.3	60.6
	15.6	28.2	56.3	
HIGH	28	54	35	117
	18.4	20.8	7.3	53.9
	23.9	46.2	29.9	
	152	259	480	891
	17.1	29.1	53.9	

Chi square = 34.003

p = .0001

gamma = -.207

Tau b = -.121

ceive themselves as more susceptible to heart disease than either the healthy or the unhealthy group.

Although these social psychological factors are significantly associated ($p = .0001$), the causal sequence in this relationship is difficult to determine. An improvement in perceived health status may be accompanied by a decrease in perceived susceptibility to heart disease. Alternatively, a decrease in perceived susceptibility may also be accompanied by an increase in perceived health status. Furthermore, this could also be a spurious relationship as the changes could be caused by other factors. A general feeling of good health may be the result of a belief that the person has a healthy lifestyle, a healthy genetic makeup, or good luck. These factors would also reduce perceived susceptibility to heart disease. It is therefore difficult to determine the causal connection between perceived health status and susceptibility to illness and/or disease.

Table 14 shows the results of crosstabulations of perceived health status and internal locus of control. The data from this study lend no support to the hypothesis. The probability value is .6015 and the gamma value is .014. A person who has a highly positive perceived health status will not necessarily have a high level of internal locus of control. The person may feel that luck has had a lot to do with his or her perceived health status. The same is true for an individual with a low perceived health status. That

TABLE 14

INTERNAL LOCUS OF CONTROL BY PERCEIVED HEALTH STATUS

COL. % / ROW %	PERCEIVED HEALTH STATUS: UNHEALTHY	MODERATE	HEALTHY	
INTERNAL LOCUS OF CONTROL				
LOW	16	41	54	111
	14.4	36.9	48.6	11.14
	9.4	13.2	10.5	
MEDIUM	99	182	309	590
	16.8	30.8	52.4	59.2
	57.9	58.5	60.1	
HIGH	56	88	151	295
	19.0	29.8	51.2	29.6
	32.7	28.3	29.4	
	171	311	514	996
	17.2	31.2	51.6	

Chi square = 2.744

p = .6015

gamma = -.014

Tau-B = .016

person may feel that luck, genetics, or some other factors are responsible for his or her bad health.[41]

Table 15 shows the results of crosstabulations of internal locus of control and perceived susceptibility. The probability value for this table is .8480 which means that a statistically significant relationship was not demonstrated. The gamma value is only .030, which means that the relationship is very weak, or practically non-existent. Overall, the data indicate a very weak, and non-significant relationship between perceived susceptibility to heart trouble and an internal locus of control.

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[41] The fact that almost 60% of the respondents were classified as "medium" on the locus of control measure may have affected the crosstab results.

TABLE 15

INTERNAL LOCUS OF CONTROL BY PERCEIVED THREAT

COL %
ROW %

INTERNAL LOCUS OF CONTROL	PERCEIVED THREAT: LOW	PERCEIVED THREAT: MEDIUM	PERCEIVED THREAT: HIGH	
LOW	23 25.6 9.9	55 61.1 10.4	12 13.3 10.4	90 10.2
MEDIUM	142 26.8 61.2	323 61.1 60.8	64 12.1 55.7	529 60.2
HIGH	67 25.9 28.9	153 59.1 28.8	39 15.1 33.9	259 29.5
	232 26.4	531 60.5	115 13.1	878

Chi square = 1.378

p = .8480

gamma = .030

Tau-B = -.008

4.3 PERCEIVED HEALTH STATUS, PERCEIVED THREAT, INTERNAL LOCUS OF CONTROL, AND HEALTH BEHAVIOR

4.3.1 Literature Review

The relationship between perceived health status and health behavior is fundamental to the Health Belief Model.[42] Yet, this relationship is seldom tested. Fink, et. al. (1972) report that the respondents in a voluntary breast examination were more likely to report that they were in good health than non-participants.

Generally, perceived health status is assumed to have an effect on variables such as perceived threat, but not a lot of research has been done to test the various hypotheses relating to perceived health status. For example, Farquhar, et. al. (1977) chose a group of people whose objective health status indicated that they were susceptible to heart disease to receive a concentrated program to alter their smoking habits.[43] Yet, the person's perceived health status was not measured. Likewise, Puska, et. al. (1979) measured objective health status, but did not measure perceived health status. Seeman and Seeman (1983) measured perceived health status and its relationship to locus of control and several demographic variables. However they did not examine the perceived health status of their sample in relation to

[42] Health behavior is typically defined as an activity undertaken by a person who considers that he/she is healthy.

[43] Susceptibility to heart disease was measured by age, sex, plasma-cholesterol concentration, blood pressure, weight, smoking rate, and electrocardiographic findings.

health behavior.

The relationship between perceived threat of a health problem and health behavior has been analyzed in several studies. Personal perceived susceptibility to tuberculosis, heart disease, or arthritis was directly related to acceptance of health examinations, in a nationwide sample of U.S. households (Borsky and Sagan 1959). They sought to determine what kind of people would accept or reject health examinations. The acceptance of a health examination was seen as a health behavior. (A follow up study showed that willingness to accept examinations "closely paralleled" real behavior when examination was provided.) The "cooperators", or people who responded that they would accept a health examination were more likely to express a belief that they were likely to get TB, heart disease, or arthritis in the next 5-10 years, than the people who expressed no desire for a physical examination.

Rosenstock (1960) also noted that the degree to which the individual believes that he or she is susceptible to a given health problem or disease will be related to his/her likelihood of taking preventive action. Heinzlemann (1962) found that health behavior relating to rheumatic fever and/or rheumatic heart disease was significantly related to perceived susceptibility.[44]

[44] Perceived susceptibility was operationalized by responses to three items: The chances of getting rheumatic fever, the chances compared to others who have had the disease,

Perceived susceptibility was found to be related to making preventive visits to the dentist, in a study of why people seek dental care (Kegeles 1963). Information was collected from a random sample of factory workers who received free dental care for themselves and their families as a fringe benefit of their contract. Persons who saw themselves as more likely to experience dental problems were more likely to make preventive visits to the dentist.

The results of another Kegeles study (1969) showed that women who scored high in perceived vulnerability were more likely to attend a clinic for a check-up for cervical cancer than women who did not score high in perceived vulnerability. The sample that was used in this program was taken from the census tract with the largest percentage of non-whites in a medium sized metropolitan area. Six groups of 35 or 36 black women were selected. The women in these groups lived in the same neighborhood.

The groups were presented information on susceptibility to cervical cancer, the nature and effectiveness of detection procedures (cytology), the importance of early detection, the nature of the test, and the place and time of the treatment. The control groups were presented information on iron deficiency and a description of the cervical test with information on where and when the treatment was to occur.

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and the chances compared to others who have not had the disease.

All of the subjects were encouraged to attend the clinic. The results also showed that more women in the experimental group attended the clinic than women in the control group.

Perceived susceptiblity was also found to be related to health behavior in a study done by Suchmann (1967). Preventive behavior was operationalized as use of a protective glove by sugar cane workers in Puerto Rico. The sample consisted of 115 sugar cane workers, who were interviewed in their homes.

Fink, et. al. (1972) report the results of a voluntary breast examination program in which perceived susceptibility was found to be related to health behavior. The program was initiated by the Health Insurance Plan of New York. A random sample of women was asked to participate in a series of breast examinations. Thirty-one thousand women were asked to participate in the program, with a total of 20,211 women accepting the invitation. The ages of the women ranged from 40-64 years, in a study group chosen for analysis. Compared to the women who did not respond to the offer, the participants were more likely to have higher perceived susceptibility to breast cancer.

Langlie (1977) studied social networks, health beliefs, and health behavior. Health behavior was defined as "any medically recommended action, voluntarily undertaken by a person who believes himself to be healthy, that tends to

prevent disease or disability and/or detect disease in an asymptomatic stage" (Langlie, 1977). Health behavior was operationalized by eleven additive scales, divided into direct and indirect risk. The eleven scales were:

1. Direct Risk: driving behavior, pedestrian behavior, smoking, personal hygiene
2. Indirect Risk: seat belt use, medical check-ups, dental care, immunizations, screening examinations, exercise, nutrition

Perceived susceptibility was measured by responses to questions dealing with the likelihood of the respondent being in a car accident, being so sick that he/she would miss work for a week, get cancer, get an electric shock, become too fat or too thin, sprain his/her ankle, have heart trouble, feel nervous, get polio, have gum trouble, take a bad fall, feel tired and listless for several weeks, get tetanus, or get tuberculosis. The results of the study showed that the direct and indirect risk behaviors were two separate groups of related behaviors. Preventive health behavior was found to be related to <u>low</u> perceived susceptibility. This was an unexpected relationship. Most of the previous research had demonstrated a direct relationship between perceived susceptibility and health behavior. This inverse relationship was seen as a result of the health behavior lowering the person's perceived susceptibility (Langlie, 1977).

The Health Belief Model was used by Becker, et. al. (1977) as basis for studying dietary compliance. The HBM was tested in a program designed for obese children, in a large pediatric clinic. The results of the study showed that the mother's concern for the child's health was correlated with a weight loss in the child. Perceived susceptibility, as defined by responses to questions concerning the child's likelihood of contracting various conditions, was correlated with compliance with the program.[45]

Dietary adherence is a somewhat unusual health behavior. The threat to health is not immediate. The appropriate action may be undertaken for non-health reasons as well, such as body image and social acceptance. Obesity is generally not regarded as an illness. Becker's study, while using the main concepts of the Health Belief Model, was an attempt to extend these concepts. (Becker, et. al. 1977:349)

Mothers are generally considered to have a major influence over family health matters (Becker, et. al. 1977:351). Therefore, the motives and perceptions of the mothers of the children in the sample were studied as predictors of her child's weight loss. The subjects were mothers and children. There were 182 respondents ranging in age from 17-62 years of age and their children, ranging in age from 19 months to 17 years. The sample was from low income groups.

[45] The conditions were strep throat, rheumatic fever, heart trouble, hardening of the arteries, anemia, pneumonia, asthma, and mumps.

The respondents were interviewed to determine beliefs, concerns, and motives relevant to health in general and obesity in particular. The respondents were then randomly assigned to a "motive-arousing" intervention program or a control group. There were two intervention programs: high and low fear. The groups were distinguished by the level of anxiety about health problems caused by obesity.

The intervention program was successful in producing weight loss. The high fear group lost the most weight, the low fear group was ranked intermediate, and the control group lost the least weight (Becker, et. al. 1977). These findings seem to indicate that a change in health behavior can be demonstrated by manipulating the perceived threat felt by the person.

Some work has also been done examining the relationship of internal locus of control and health behavior. An internal locus of control indicates that the individual believes that he or she has some level of control over his/her health. A person with a high level of perceived internal control will be more likely to view a particular health behavior as effective in preventing disease or maintaining good health, because he or she believes that individual action is effective in determining health status. The person with a lower level of internal locus of control is more likely to emphasize luck or events beyond his or her control in determining health or illness levels.

In the Kegeles (1963) study cited earlier, it was found that a belief in natural (rather than fatalistic) causes of dental problems was associated with preventive visits to a dentist. A belief in natural causes, as opposed to fatalistic causes could be related to higher levels of internal locus of control. Belief in fatalistic causes indicates that the person believes that he/she has little control over his/her life. Internal locus of control (as measured by responses to statements designed to measure first person and third person perceived internal control) was found to be related to an 11 item scale of health behaviors by Langlie (1977). Suchman states that a "strong and highly significant relationship" was demonstrated between individuals who believed they had some control over accidents and preventive action behavior" (Suchman 1967:199).

In a recent paper published by Seeman and Seeman (1983) the relationship between health behavior and personal autonomy was explored. The sample for the study consisted of 931 respondents in Los Angeles. Each respondent was interviewed twice, with a one year interval between the interviews. This was done to chart the outcome of illness episodes, and the respondents' reactions to the illness and the outcome.

Two aspects of locus of control were studied i.e., personal mastery and luck denial. (Personal mastery was measured by responses to first person statements. Responses to more general items dealing with luck were used to operation-

alize luck denial.) The factors were found to be independent of each other. Personal mastery was found to be the better predictor for health behavior and luck denial was the better predictor for illness behavior.[46] "Whatever the level of initial health at Time 1, respondents with a sense of control achieve a better health rating at Time 2" (Seeman and Seeman, 1983:147).[47]

Preventive health behavior was associated with the individual's sense of control in the first and second interviews whether the researchers controlled for resources (education, income, SES), situational circumstances (marriage, age, gender, and race), or health motivation relevant to preventive health action. A sense of control was associated with preventive health behavior and an effort to stop or cut down smoking.

The authors stated two criticisms of their study. The first criticism is that the data are based on self reports, which may be distorted. Yet, the self reports were consistent over a year. Secondly, the causal sequence is difficult to untangle. A sense of control can be a product and a determinant of health experience. For example, a person

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[46] A list of nine activities that were "'not recommended by a doctor' but that were health protective" was included in the interviews (Seeman and Seeman, 1983:147). A scale of health behaviors was constructed from the responses to the items.

[47] Time 1 was when the first interview was conducted and Time 2 was when the second interview was conducted.

with a high level of internal control is probably more likely to undertake a particular health behavior, because he/she feels that individual action is likely to affect health. In this case, the sense of control would be a determinant of a health behavior. On the other hand, a person who engages in a health behavior may experience an increase in perceived internal control, due to the anticipated effect of the health behavior upon the person's health status. In this instance, the sense of control would be a product of the health behavior. However Seeman and Seeman (1983) did find that general health improved for people with high control.

4.3.2 Statement of Hypotheses

Three hypotheses will be studied in this section:

1. Perceived health status is directly related to health behavior.
2. Perceived threat is directly related to health behavior.
3. An internal locus of control is directly related to health behavior.

4.3.3 Operationalization of Health Behavior

The health behavior under investigation in this study was smoking. Respondents were asked to describe their experience with tobacco and were categorized as those who have

never smoked, those who used to smoke and those who now smoke. People who reported never having smoked or that they had quit smoking are seen as demonstrating preventive or restorative health behavior.[48]

4.3.4 Findings and Discussion

Approximately forty-one percent of the respondents currently smoke either daily or occasionally (i.e., 40.6%, n = 406). The remainder are fairly evenly divided between ex-smokers (28.5%, n = 285) and those who have never smoked (30.8%, n = 308). The probability value for Table 16 indicates that a statistically significant relationship does not exist between perceived health status and smoking behavior.[49] The value for lambda also indicates that there is no association between the dependent variable (smoking behavior) and the independent variable (perceived health status). Yet, there is an indication that people who currently smoke are less likely to have a perception of good health when compared to the two groups of non-smokers. (Only 38.4% of smokers felt healthy, compared to 49.7% of those who had never smoked, and 40.1% of ex-smokers.)

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[48] Question 21 in Appendix B

[49] Forty-seven cases are not included in this table due to missing values for perceived health status or smoking behavior.

TABLE 16

SMOKING BEHAVIOR BY PERCEIVED HEALTH STATUS

COL %
ROW %

PERCEIVED HEALTH STATUS

SMOKING BEHAVIOR	UNHEALTHY	MODERATE	HEALTHY	
NEVER SMOKED	45 27.3 14.8	100 32.0 32.9	159 31.2 52.3	304 30.8
EX-SMOKERS	38 23.0 13.6	87 27.9 31.1	155 30.4 55.4	280 28.4
SMOKERS	82 49.7 20.4	125 40.1 31.0	196 38.4 48.6	403 40.8
	165 16.7	312 31.6	510 51.7	987

Chi square = 7.209

p = .1253

lambda = .000

Tau-B = -.047

There is little difference in the perceived health status of those who have never smoked and the ex-smokers. Therefore these two groups were combined for further analysis. The results are shown in Table 17. A significant relationship is demonstrated if the respondents are grouped into smokers and non-smokers ($p = .035$). In this case, the hypothesis is supported. A better perceived health status is associated with being a non-smoker, i.e., one who has never smoked or has stopped smoking compared to those who currently smoke. Of the smokers, 20.4% perceived themselves to be unhealthy, compared to 14.2% of the non-smokers. The non-smokers were also more likely than the smokers to view their health in positive terms (53.8% compared to 48.6%). While the difference is statistically significant, the association between perceived health status and smoking status is not very strong.[50]

The results of computing crosstabs between perceived susceptibility and smoking behavior are shown in Table 18. The Health Belief Model suggests that higher levels of perceived susceptibility should be associated with health behavior (avoiding smoking). The data from this study show no significant relationship between level of perceived susceptibility and smoking avoidance ($p=.28$). One possible explanation for this finding could be that avoiding smoking lessens

[50] Gamma was used as a measure of association for Table 16, rather than lambda as in Table 15, because the smoking status variable has only two values, and may therefore be analyzed as an ordinal variable.

TABLE 17

SMOKING STATUS BY PERCEIVED HEALTH STATUS

COL %
ROW %

SMOKING STATUS	PERCEIVED HEALTH STATUS: UNHEALTHY	MODERATE	HEALTHY	
NON-SMOKERS	83	187	314	584
	50.3	59.9	61.6	59.2
	14.2	32.0	53.8	
SMOKERS	82	125	196	403
	49.7	40.1	38.4	40.8
	20.4	31.0	48.6	
	165	312	510	987
	16.7	31.6	51.7	

Chi square = 6.660

p = .0358

gamma = -.119

TABLE 18

SMOKING BEHAVIOR BY PERCEIVED SUSCEPTIBILITY

COL %
ROW %

SMOKING BEHAVIOR	PERCEIVED SUSCEPTIBILITY: LOW	MEDIUM	HIGH	
NEVER SMOKED	78	161	33	272
	33.8	30.3	29.5	31.1
	28.7	59.2	12.1	
EX-SMOKERS	69	147	25	241
	29.9	27.6	22.3	27.5
	28.6	61.0	10.4	
SMOKERS	84	224	54	362
	36.4	42.1	48.2	41.4
	23.2	61.9	14.9	
	231	532	112	875
	26.4	60.8	12.8	

Chi square = 5.046

p = .2826

lambda = .000

Tau-B = .057

a person's perceived susceptibility. In other words, a person who does not smoke may feel that he/she is less susceptible to heart disease, because he/she does not smoke. Conversely, the perceived susceptibility to heart disease may be higher for a person who smokes, if that person believes smoking and heart disease are related. Langlie (1977) proposed this hypothesis to account for the same finding in his data. The exact causal sequence is impossible to determine from either set of data.

Table 19 shows the results of the crosstabs for internal locus of control and the dependent variable (smoking behavior). The probability value for this table is only .40 which indicates that there is not a significant relationship present. The lambda is .000, which indicates that there is no association between internal locus of control and smoking behavior.

Respondents with a low internal locus of control are just as likely to be smokers as the respondents with a high internal locus of control. Although an internal locus of control has been shown to be a factor in other health behavior decisions (Kegeles, 1963; Battistella, 1971; Langlie, 1977; Seeman and Seeman, 1983), it does not seem to be related to the smoking decision. It is also possible that the internal locus of control scale devised for this study does not accurately measure the aspect of perceived control that enters into the smoking decision. For example, a person with a

TABLE 19

SMOKING BEHAVIOR BY INTERNAL LOCUS OF CONTROL

COL %
ROW %

SMOKING BEHAVIOR	INTERNAL LOCUS OF CONTROL: LOW	MODERATE	HIGH	
NEVER SMOKED	35	164	98	297
	31.2	28.7	33.8	30.5
	11.8	55.2	33.0	
EX-SMOKERS	33	175	72	280
	29.5	30.6	24.8	28.8
	11.8	62.5	25.7	
SMOKERS	44	233	120	397
	39.3	40.7	41.4	40.8
	11.1	58.7	30.2	
	112	572	290	974
	11.5	58.7	29.8	

Chi square = 4.015

p = .4040

lambda = .000

Tau-B = -.009

high level of perceived internal control may feel that other health behaviors such as exercise and proper diet will lessen his/her chances of having heart problems.

4.4 INTERACTION BETWEEN SOCIAL PSYCHOLOGICAL VARIABLES

An attempt was made to analyze the relationships between the social psychological factors (perceived health status, perceived threat, and internal locus of control) and the dependent variable (smoking behavior). Appropriate crosstabs were run to note the interaction of each set of relationships between perceived health status, perceived threat, and internal locus of control, with smoking behavior, while controlling for each of the social psychological variables. A correlation matrix was calculated to determine the interrelationships between these variables. Finally, multiple regressions were calculated to determine the amount of variance explained in the dependent variable by the social psychological variables.[51]

Table 20 shows the correlation matrix for the three social psychological variables and smoking behavior. The only correlation between the social psychological factors that is clearly statistically significant is the one between perceived health status and perceived threat. However, this

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[51] Continuous, ungrouped data were used for the correlational and regression analyses, rather than the categorical data used in the bivariate analysis of the social psychological factors and health behavior.

relationship is not particularly strong (r = -.099). Furthermore, none of the social psychological measures appear to be correlates of smoking behavior.

TABLE 20

Correlation of Social Psychological Factors and Smoking Behavior

(Correlation coefficients)
(Probabilities)

	(PHS)	(PT)	(LOC)	(SB)
Perceived Health Status (PHS)	1.000 .000	-.099 .003	-.022 .480	-.062 .052
Perceived Threat (PT)	-.099 .003	1.000 .000	.017 .614	.060 .075
Internal Locus of Control (LOC)	-.022 .480	.017 .614	1.000 .000	-.010 .744
Smoking Behavior (SB)	-.062 .052	.060 .075	-.010 .744	1.000 .000

According to the Health Belief Model, it would be expected that a stronger relationship should exist between these social psychological variables. For these data, though, it is not surprising that more significant relationships did not appear in the correlations, when none were found in the crosstabs, cited earlier, between the variables. Possible explanations for expected relationships not appearing were also stated at that time.

Finally, all three of the social psychological variables were forced into a stepwise regression with smoking behavior

as the dependent variable. The R square was very small.[52] This indicates that virtually none of the variance in smoking behavior is explained by the social psychological variables.

The variables explored in this section are crucial to the Health Belief Model, yet these data do not support the hypothesized relationships between individual perceptions and health behavior. Several reasons for this lack of support were postulated throughout this chapter.

One reason for the lack of support for the expected relationships is probably the lack of perceived connection between the specific disease and the type of health behavior investigated in this study. For example, the connection between perceived threat of lung cancer and smoking behavior is probably more evident to the public than susceptibility to heart disease.

There could be other reasons for the lack of demonstrated relationships. The choice of smoking as the health behavior to be explained could be responsible for the lack of demonstrated relationships between the social psychological variables and the health behavior. The smoking decision may not be affected by the social psychological variables that were used in the analysis. Perceived health status, perceived

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[52] When pairwise deletions of missing values was used the R square was .00695. The R square was .01108 when listwise deletions of missing cases was used.

threat, and an internal locus of control may influence health behaviors such as medical check-ups, exercise programs, and diet more than they affect the smoking decision.

Another factor contributing to the absence of expected relationships could be the nature of the relationships themselves. Most of the relationships discussed in this chapter are seldom, if ever, tested in other research. These relationships are assumed to exist, and further analysis, using the HBM is done. These relationships are complex and may not lend themselves to investigation by cross-sectional data. Longitudinal analysis may be necessary to study these relationships, to determine causal sequences. For example, perceived health status and perceived threat may not be a simple one way relationship. A change in perceived threat may influence a change in perceived health status as well as the opposite influence of perceived health status upon perceived threat.

There may also be a problem with validity for some of the concepts. The operationalizations have face validity, but it would be difficult to determine if the operationalizations used are actually able to define the exact concept that is specified. Due to these and other more specific problems addressed in the chapter, these date demonstrate virtually no clear relationships between the social psychological components of the model and smoking behavior.

Chapter V

THE IMPACT OF MODIFYING FACTORS ON OTHER VARIABLES IN THE HEALTH BELIEF MODEL

5.1 INTRODUCTION

According to the Health Belief Model, modifying factors influence the social psychological factors and preventive health action. For example, prior personal contact with a disease should increase the perceived threat of that disease and efforts to prevent its reoccurence. The modifying factors selected for this study are knowledge of the disease and direct contact with the disease (i.e., whether or not the individual has ever had heart trouble). The social psychological factors to be studied are perceived threat and internal locus of control.[53]

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[53] The original HBM does not hypothesize any relationship between these modifying factors and perceived health status and they were not added for the present study. Also, the relationship between prior personal contact with heart disease and perceived threat was not explored, since persons who reported having had heart trouble did not answer the questions on perceived threat.

5.2 DIRECT CONTACT WITH HEART DISEASE, KNOWLEDGE RELATING TO HEART DISEASE

5.2.1 Literature Review

According to the modified Health Belief Model, direct contact with a disease should be associated with a lower level of internal locus of control.[54] It is postulated that if a person has had a disease, he/she is likely to feel less personal control regarding the occurence of the disease. In the context of this study, it was reasoned that if a person has had heart trouble in the past, his or her sense of internal locus of control would be lower than a person who has not had heart problems. Prior contact with the disease may make the person feel that he/she has less personal control over health matters. This relationship has not been addressed in the literature.

The relationship between knowledge of a disease and perceived threat of that disease has been looked at by a few researchers. Levine (1962) published the results of a survey of a sample of 2970 individuals from across the United States, concerning cancer, polio, cerebral palsy, arthritis, tuberculosis, and birth defects. One of the findings of this study was that knowledge about the disease was related to level of anxiety.[55] Knowledge about a disease was more

[54] An individual who has had a disease is said to have direct contact with that disease.

[55] Anxiety was measured by scales based upon level of reported fear of the six diseases. Respondents were asked whether or not they felt that the diseases are fatal, expensive to treat, curable, crippling, and inherited;

important in producing anxiety than knowing someone who had the disease. Levine did not specifically look at perceived susceptibility and its relation to knowledge. Yet, perceived susceptibility is a large part of anxiety regarding disease. Therefore Levine's work does add some support to the hypothesis.

In the Kegeles (1969) study, information regarding cervical cancer, presented to experimental groups changed 21 of 31 subjects from low to high perceived vulnerability. Yet, similar results were obtained in the control group. This is probably due to the type of control group used in this study. The "control" group also received health information relating to the specific treatment, although the information was not as intensive as the information presented to the experimental group. A true control group, with no health information, should have been included in order to make valid comparisons.

According to the modified HBM, knowledge of a disease should increase the level of internal locus of control related to that disease. The rationale for this expected relationship is that increased knowledge about a disease may lead to an awareness of how to avoid the disease. For example, increased knowledge about heart disease may make it possible for the individual to eliminate those modifiable

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whether many or few, old or young people are usually afflicted; how much they feel they know about the disease; and how much they fear it (Levine 1962).

risk factors such as smoking which increase the chances of having heart disease. This should result in a greater sense of internal locus of control, since the person realizes that he or she can affect the chances of experiencing heart disease.

Once again, this relationship is implied in the HBM, but has rarely been tested. Seeman and Seeman (1983) measured knowledge of cancer by responses to items dealing with the symptoms and causes of the disease. They report that knowledge regarding cancer was not correlated with a sense of control.

5.2.2 Statement of Hypotheses

The following hypotheses will be tested in this section:

1. Direct contact with the disease is directly related to locus of control.
2. Knowledge of the disease is directly related to perceived threat.
3. Knowledge of the disease is directly related to internal locus of control.

5.2.3 Operationalization of Modifying Factors

The respondents were asked if they had ever had heart trouble (Question 40 Appendix B). Of the 945 people who responded to the question, 89 (9.4%) reported having had some type of heart trouble, while 856 (90.6%) reported never hav-

ing heart problems.[56]

To measure knowledge about heart disease, each respondent was presented with six statements about various aspects of heart trouble and was asked to indicate whether the items were true or false.[57] A space was also provided for a "don't know" response. Each respondent was given a score corresponding to the number of correct responses. Table 21 shows the frequency distribution for this variable.

TABLE 21

Knowledge of Heart Disease

# of items answered correctly	N	%
0	7	.7
1	27	2.6
2	65	6.3
3	124	12.0
4	254	24.6
5	343	33.2
6	214	20.7
	1034	100.1

[56] 26 people responded "don't know" to the question and 63 people did not respond

[57] Statements such as "Heart disease is hereditary," and "Most heart attacks are fatal" were used. See Appendix B, question 5.

Table 21 indicates that the sample generally, has a good knowledge of heart problems. Half (53.9%) answered at least 5 of the 6 items correctly, and 78.5% answered 4 or more of the items correctly. The 7 persons who answered none of the items correctly were people who did not respond to the question or responded "don't know". Nobody answered all of the questions incorrectly.

5.2.4 Findings and Discussion

Table 22 shows crosstabs for direct contact with heart disease and internal locus of control. The relationship is statistically significant (p=.007), but the gamma is quite low (.169) indicating a weak overall relationship. Yet, some interesting results are shown. The percentage of people who reported that they have had heart problems does not vary much between the moderate and high groups of internal locus of control (8.2% for moderate) and (8.8% for high), but is twice as high (17.9%) among those respondents with a low level of internal locus of control. This is consistent with the Health Belief Model.

Table 23 shows the results of crosstabulations of knowledge of heart disease and perceived susceptibility. The probability value indicates that a significant relationship exists, but the gamma value indicates that there is a very weak association between the variables.[58]

[58] Combining the people with 1 or 0 correct answers on the

TABLE 22

INTERNAL LOCUS OF CONTROL BY DIRECT CONTACT WITH HEART DISEASE

DIRECT CONTACT WITH HEART DISEASE

INTERNAL LOCUS OF CONTROL	YES	NO	
LOW	19 21.6 17.9	87 10.4 82.1	106 11.5
MEDIUM	45 51.1 8.2	502 60.0 91.8	547 59.1
HIGH	24 27.3 8.8	248 29.6 91.2	272 29.4
	88 9.5	837 90.5	925

COL %
ROW %

Chi square = 9.914

p = .0070

gamma = .169

Tau-B = .056

TABLE 23

PERCEIVED SUSCEPTIBILITY BY KNOWLEDGE OF HEART DISEASE

COL %
ROW %

KNOWLEDGE OF HEART DISEASE (NUMBER OF ITEMS ANSWERED CORRECTLY)

PERCEIVED SUSCEPTIBILITY	0	1	2	3	4	5	6	
LOW	2 40.0 .8	11 55.0 4.6	19 35.2 8.0	23 22.1 9.6	50 22.4 20.9	94 31.0 39.3	40 21.0 16.7	239 26.6
MEDIUM	2 40.0 .4	7 35.0 1.3	28 51.8 5.2	61 58.6 11.2	147 65.9 27.1	175 57.8 32.2	123 64.7 22.6	543 60.4
HIGH	1 20.0 .8	2 10.0 1.7	7 13.0 6.0	20 19.2 17.1	26 11.7 22.2	34 11.2 29.1	27 14.2 23.1	117 13.0
	5 .6	20 2.2	54 6.0	104 11.6	223 24.8	303 33.7	190 21.1	899

Chi square = 24.524

p = .0172

gamma = .029

The manner in which knowledge was measured could be the reason for the weak demonstrated relationship. The type of knowledge that would have the most influence upon perceived threat is likely to be knowledge regarding the causes of heart disease. The operationalization used in this study relates to general knowledge of heart problems. More questions regarding the causes of heart disease, such as the influence of smoking and diet should have been included. It is possible that people with higher levels of knowledge regarding the origins of heart disease would differ in amount of perceived susceptibility, when compared to people with less knowledge about causes of heart trouble.

Table 24 shows the results of crosstabulations of knowledge about heart disease and internal locus of control. The low probability value indicates that the relationship between knowledge and locus of control is not statistically significant. There is also very little association between the variables, as indicated by the low gamma value. Level of knowledge about heart disease does not seem to be related to the respondents' beliefs about the individual's ability to prevent the onset of illness. While the hypothesis is not supported, this is consistent with the findings reported by Seeman and Seeman.

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knowledge scale into one group did not increase the gamma for the crosstabs.

TABLE 24

INTERNAL LOCUS OF CONTROL BY KNOWLEDGE OF HEART DISEASE

COL %
ROW %

KNOWLEDGE OF HEART DISEASE (NUMBER OF ITEMS ANSWERED CORRECTLY)

INTERNAL LOCUS OF CONTROL	0	1	2	3	4	5	6	
LOW	0 .0 .0	1 3.8 .9	8 13.3 7.0	11 9.2 9.6	23 9.2 20.0	41 12.2 35.6	31 14.6 27.0	115 11.4
MEDIUM	3 75.0 .5	18 69.2 3.0	32 53.3 5.4	72 60.5 12.1	138 55.4 23.2	199 59.2 33.4	133 62.4 22.4	595 59.1
HIGH	1 25.0 .3	7 26.9 2.4	20 33.3 6.7	36 30.2 12.1	88 35.3 29.6	96 28.6 32.3	49 23.0 16.5	297 29.5
	4	26	60	119	249	336	213	1007

Chi square = 13.907

p = .3067

gamma = -.113

The internal locus of control scale was based on questions dealing with overall health maintenance by the individual. Knowledge about a specific disease (heart disease) may be too narrow a range of medical knowledge to have any appreciable effect upon internal locus of control. If the knowledge variable measured knowledge about the causes of heart disease and the locus of control variable measured perceived control of heart disease, the association might be stronger. People with better knowledge of the causes of the disease would realize that choices in lifestyle may have an affect on their chances of having heart problems. Therefore they might express a higher level of internal locus of control regarding heart disease.

5.3 MODIFYING FACTORS AND HEALTH BEHAVIOR

5.3.1 Literature Review

The modified Health Belief Model shows a direct relationship between contact with the disease and health behavior. It is reasoned that if a person has had a disease or illness, in the past, he/she will be more likely to exhibit health behavior upon recovery, to maintain his/her health or to prevent a re-occurance of the health problem. In the original HBM the influence of prior contact with the disease upon health behavior was seen as occuring indirectly through the perceived threat of the disease. Therefore, there has been no research upon the direct relationship that exists in the modified version of the model.

The relationship between knowledge of the disease and health behavior has been analyzed in several studies. Kutner and Gordon (1961) published the results of a study of people's attitudes and behaviors relating to seeking medical care for cancer symptoms. The sample included 808 people ranging in age from 18 to over 70 years, living in New York City. The subjects were interviewed in their homes. The questions regarding cancer were interspersed with other questions to conceal the purpose of the study. It was demonstrated in this study that more knowledge about cancer is correlated with less delay in seeking help in the presence of cancer symptoms.

Heinzelmann (1962) studied prophylaxis behavior in the treatment of rheumatic fever. The sample consisted of 284 college students, each with a history of rheumatic fever and/or rheumatic heart disease. Prophylaxis was operationalized as continuous treatment with anti-streptococcal, which has been found to be effective in preventing recurrent attacks of rheumatic fever. Knowledge was operationalized by the responses to items dealing with the causes, consequences, and means of preventing rheumatic fever. Prophylaxis was found to be significantly related to beliefs and knowledge concerning various aspects of rheumatic fever.

Suchman (1967) found that knowledge about accident prevention was related to the use of a protective glove, that was designed to lessen the chances of accidents while cut-

ting sugar cane. Antonovsky and Kats (1970) found a "limited relationship" between knowledge of health action and participation in a preventive dental care plan, offered at a minimal cost to 1645 employees of the Hadassah Medical Organization. Rosenstock (1975) states that knowledge of a disease is necessary for an individual to exhibit health behavior. A person who has no knowledge of a disease will have no reason to participate in a health behavior to prevent that disease. Likewise, a person with a great deal of knowledge about a disease will be more likely to undertake a health behavior.

Farquhar (1977) studied three northern California towns. The program was an attempt to modify cigarette smoking, high plasma-cholesterol concentrations, and high blood pressure, three risk factors associated with cardiovascular disease. The sample consisted of men and women 35-59 years of age. Interviews were conducted with the people in the sample to determine their knowledge about heart disease and behavior related to cardiovascular risk. Knowledge was operationalized by responses to 25 items relating to heart disease. Diet content and smoking behavior were noted as a measurement of behavior relating to heart disease risk. Measurements were also taken of cholesterol and triglyceride concentrations, blood pressure, and weight.

A mass media campaign was conducted in two of the three towns to inform people about the risk factors associated

with cardiovascular disease and preventive health behaviors appropriate to preventing heart disease, such as smoking cessation and proper diet. Two-thirds of the high risk people in one of these two towns were given additional counselling pertaining to risks and preventive measures associated with heart disease. The third town served as a control.

The results of the program showed that the media campaign and the instruction campaign had a positive effect on all symptoms except weight. (Smoking behavior, cholesterol concentrations, and blood pressure were all influenced.) The addition of the instruction had a cumulative positive effect.

5.3.2 Statement of Hypotheses

The two hypotheses to be examined in this section are:

1. Direct contact with the disease is directly related to health behavior.
2. Knowledge of the disease is directly related to health behavior.

5.3.3 Findings and Discussion

The data in Table 25 show that persons who have had heart problems in the past are more likely to be ex-smokers (40%) than either current smokers (33%) or people who have never

TABLE 25

SMOKING BEHAVIOR BY DIRECT CONTACT WITH HEART DISEASE

COL %
ROW %

DIRECT CONTACT WITH HEART DISEASE

SMOKING BEHAVIOR	YES	NO	
NEVER SMOKED	24	255	279
	27.3	30.4	30.1
	8.6	91.4	
EX-SMOKERS	35	229	264
	39.8	27.3	28.5
	13.3	86.7	
SMOKERS	29	354	383
	33.0	42.2	41.4
	7.8	92.4	
	88	838	926
	9.5	90.5	

Chi square = 6.252

p = .0439

lambda = .000

Tau-B = .024

smoked (27%). This action may not be a health behavior, in some cases. A perception of good health is a condition for asymptomatic preventive health behavior. In cases where people do not consider themselves healthy, the decision to stop smoking may be more appropriately seen as sick role behavior. That is, the person may stop smoking as a continuing treatment for a chronic condition or to comply with doctor's orders.

Therefore, in this data set, it is difficult to determine how much of the variation in smoking is actually a result of health behavior.[59] Crosstabulations for contact with the disease and smoking behavior, controlling for perceived health status, did not yield any significant results.

Table 26 shows the result of crosstabulations of knowledge of heart disease and smoking behavior. It is obvious that there is no relationship between the two variables. A greater knowledge of heart disease is not associated with the appropriate health behavior. It is possible that the knowledge questions are too general to affect a specific behavior such as smoking. The knowledge questions are not specific to smoking and its influence upon heart disease. They deal with general knowledge regarding heart problems. The lack of a relationship between these variables would be

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[59] The data reveals a statistically significant relationship, but the value for lambda is .000, which means that there is no association between smoking behavior and the direct contact variable.

TABLE 26

SMOKING BEHAVIOR BY KNOWLEDGE OF HEART DISEASE

COL %
ROW %

KNOWLEDGE OF HEART DISEASE (NUMBER OF ITEMS ANSWERED CORRECTLY)

SMOKING BEHAVIOR	0	1	2	3	4	5	6	
NEVER SMOKED	1	10	16	40	82	97	62	308
	14.3	40.0	27.6	33.9	32.9	29.2	29.5	30.8
	.3	3.2	5.2	13.0	26.6	31.5	20.1	
EX-SMOKERS	3	5	11	31	66	102	67	285
	42.9	20.0	19.0	26.3	26.5	30.7	31.9	28.5
	1.0	1.8	3.9	10.9	23.2	35.8	23.5	
SMOKERS	3	10	31	47	101	133	81	406
	42.9	40.0	53.4	39.8	40.6	40.1	38.6	40.6
	.7	2.5	7.6	11.6	24.9	32.8	20.0	
	7	25	58	118	249	332	210	999
	.7	2.5	5.8	11.8	24.9	33.2	21.0	

Chi square = 10.203

p = .5982

lambda = .000

more likely for a sample that does not perceive smoking as a major factor in causing heart disease.

5.4 CONCLUSION

The hypotheses dealing with direct contact were supported to some extent in this chapter. Having previous heart problems was found to be associated with a lower level of internal locus of control and smoking behavior. None of the hypotheses regarding knowledge was supported. The type of knowledge measured by this study seems to have no effect upon perceived threat of heart disease, internal locus of control, or smoking behavior.[60]

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[60] A multiple regression was calculated with smoking behavior as the dependent variable. An attempt was made to enter the modifying factors, in addition to the social psychological variables. Perceived threat was deleted from the analysis because it could not be correlated with the direct contact variable. (Persons who had direct contact did not respond to the perceived threat questions.) The R square for the remaining four independent variables (direct contact, knowledge, perceived health status, and internal locus of control), was only .00486, which is negligible. It is even less than was calculated with only the social psychological variables as independent variables (.00695). This is due to the omission of perceived threat from the analysis.

Chapter VI

THE IMPACT OF CUES TO ACTION ON OTHER VARIABLES IN THE HEALTH BELIEF MODEL

6.1 INTRODUCTION

This chapter will examine the influence of cues to action upon other components of the Health Belief Model. A "force for action" is created by the social psychological and modifying factors, yet the cues to action may be needed as a "push" to initiate health behavior.

In the original Health Belief Model, cues to action were shown to influence the perceived threat of a disease, and therefore, indirectly influence health behavior. In the modified model, used for this study, an attempt was made to determine the direct influence of cues to action upon perceived threat, internal locus of control, as well as health behavior. Indirect contact with heart disease was the cue to action studied (i.e., having an immediate family member or a close friend who has had heart disease).

6.2 INDIRECT CONTACT WITH HEART DISEASE AND SOCIAL PSYCHOLOGICAL VARIABLES

6.2.1 Statement of Hypotheses

The hypotheses to be tested in this section are:

1. Contact with a family member/friend who has had the disease is directly related to perceived threat.
2. Contact with a family member/friend who has had the disease is directly related to internal locus of control.

The relationship of indirect contact with a disease and perceived health status was not shown on the original Health Belief Model. This relationship was not added to the modified model used in this study.

6.2.2 Literature Review

The relationship between indirect contact with a disease and perceived threat of that disease was explicitly stated in the original HBM, but has been seldom tested. It seems logical to assume that a person who is in close contact with a significant other who has heart problems will feel that he or she is more susceptible to this disease. Close contact with a person with a heart condition should reduce the perception that heart problems always happen to other people. Contact with a heart patient forces the individual to think about heart disease, its causes, and consequences. If the person with the heart condition is a close relative, the in-

dividual's perceived susceptibility may also increase due to the belief that the heart disease may be hereditary. This would increase the susceptibility of all family members.

A study of anxiety related to six illnesses[61] found that "people who know a victim of a disease... are more likely to say they fear the maladies 'a lot' than those who do not know a victim" (Langlie, 1962:30-31). The people in the study were most likely to fear the disease a lot if the known victim was someone close to them. The relationship between indirect contact with a disease and internal locus of control is not included in the original Health Belief Model and has not been investigated in any major research. The reasoning behind this hypothesis is that even indirect contact with a disease will increase a person's familiarity and experience and therefore increase that person's internal locus of control. It is reasoned that the person will know what to do to avoid the disease, and will not be as likely to feel that it is luck or fate that decides who will get a particular disease.

6.2.3 Operationalization of Cue to Action

Indirect contact with heart disease was measured by a number of questions.[62] The questions asked whether the respondent's father, mother, any other member of his/her immediate fami-

[61] The illnesses were polio, cerebral palsy, arthritis, tuberculosis, birth defects, and cancer.

[62] See Appendix B, questions #41-43

ly, or a close friend ever had a number of disorders (heart trouble, high blood pressure, stroke, diabetes, cancer). Only responses to questions about heart trouble are included in the present analysis. If the respondent reported that either a father, a mother, or any other member of the immediate family, or a close friend had experienced heart trouble, he/she was viewed as having indirect contact with the disease. In total, 65.2% of the sample had indirect contact with heart disease and 34.8% had no contact.

6.2.4 Findings and Discussion

The data shown in Table 27 support the hypothesis that indirect contact with heart disease is associated with higher levels of perceived susceptibility. Of the respondents who had a family member/friend with heart disease, only 22% scored low in perceived susceptibility, compared to 34.1% of the people with no indirect contact. In contrast, of the people who have had indirect contact with heart disease, 15.4% perceived themselves to be highly susceptible compared to only 9.1% of the people in the "no contact" group. The findings are even more dramatic when the people with high perceived susceptibility are analyzed. Of these people, 73.9% have had contact through a family member or friend with heart trouble, while only 26.1% report having no contact with the disease.

TABLE 27

PERCEIVED SUSCEPTIBILITY BY INDIRECT CONTACT WITH HEART DISEASE

COL %
ROW %

INDIRECT CONTACT WITH HEART DISEASE

PERCEIVED SUSCEPTIBILITY	YES	NO	
LOW	121 22.0 51.7	113 34.1 48.3	234 26.5
MEDIUM	345 62.6 64.7	188 56.8 35.3	533 60.4
HIGH	85 15.4 73.9	30 9.1 26.1	115 13.0
	551 62.5	331 37.5	882

Chi square = 19.139

p = .0001

gamma = -.275

Tau-B = -.141

TABLE 28

INTERNAL LOCUS OF CONTROL BY INDIRECT CONTACT WITH HEART DISEASE

COL %
ROW %

INDIRECT CONTACT WITH HEART DISEASE

INTERNAL LOCUS OF CONTROL	YES	NO	
LOW	77 11.9 68.8	35 10.2 31.2	112 11.3
MEDIUM	387 59.9 66.0	199 58.0 34.0	586 59.2
HIGH	182 28.2 62.5	109 31.8 37.5	291 29.4
	646 65.3	343 34.7	989

Chi square = 1.707

p = .4260

gamma = .080

Tau-B = .040

The data in Table 28 do not support the hypothesis that indirect contact with heart disease will be associated with internal locus of control. No statistically significant relationship was found and the gamma value is negligible. There is no relationship between indirect contact with heart disease and internal locus of control.

The rationale for the hypothesis cited in the previous section stated that contact with a disease will increase a person's familiarity and experience with ways to avoid the disease, thereby increasing that person's internal locus of control. It is also possible that if a close relative or friend has heart problems, the respondent may feel that luck, fate, or genetics was responsible. This would lower the level of internal locus of control. It is also possible that the locus of control questions are too general to be influenced by contact with one particular disease, such as heart disease.

6.3 INDIRECT CONTACT WITH HEART DISEASE AND HEALTH BEHAVIOR

6.3.1 Literature Review

The relationship between these variables suggests that having a family member or close friend who has had a particular disease will influence an individual to take preventive measures to lessen the chance that he or she will experience the disease. In a study of participation in a screening program for breast cancer the non-participants in a volun-

tary breast examination program were characterized as having a family history of cancer. (Fink, et. al. 1972) The explanation given by the authors of that study was that cancer was perceived as a serious disease. Therefore, to participate in the examination program would have caused a person with a family history of cancer, and a high level of perceived susceptibility, a great deal of anxiety. Another possible explanation for this finding is that the people with a family history of cancer would be more likely to already have had a recent breast examination, due to the higher level of perceived susceptibility. It would therefore be considered redundant to undergo another examination.

6.3.2 Statement of Hypothesis

The specific hypothesis to be addressed in this sections is: indirect contact with heart disease is directly related to health behavior.

6.3.3 Findings and Discussion

The data in Table 29 do not support the hypothesis. Indirect contact with heart disease is not associated with smoking behavior. It is possible that people do not make the connection between smoking and heart disease. This hypothesis might be supported if the disease being studied was lung cancer. Lung cancer is more often perceived as a health hazard of smoking than is heart disease.

TABLE 29

SMOKING BEHAVIOR BY INDIRECT CONTACT WITH HEART DISEASE

COL %
ROW %

INDIRECT CONTACT WITH HEART DISEASE

SMOKING BEHAVIOR	YES	NO	
NEVER SMOKED	193 30.4 63.7	110 31.8 36.3	303 30.9
EX-SMOKERS	181 28.5 65.3	96 27.8 34.7	277 28.2
SMOKERS	261 41.1 65.1	140 40.5 34.9	401 40.9
	635 64.7	346 35.3	981

Chi square = .210

p = .9004

lambda = .000

6.4 CONCLUSION

A stepwise multiple regression was calculated, adding indirect contact to the social psychological and modifying factors. This inclusion was only successful in raising the R square from .00486 to .00507. These variables explain virtually none of the variance in the dependent variable.

The lack of evidence supporting the hypotheses in this chapter could be due to several factors. It is generally accepted that several cues to action may be necessary to create a "push" to set in process the health behavior. In this study, only one cue (indirect contact with the disease) was analyzed.

Studies such as Suchman (1967) and Fink, et. al. (1972) also did not demonstrate a relationship between cues to action and health behavior. The present study is consistent with those findings. Fink, et. al. (1972) suggest that a cue to action may be ineffective if the disease being studied creates anxiety in the respondent. Furthermore, the effect of the cue to action may be dependent upon the type of health problem. The findings of the present study suggest that the smoking decision is apparently not influenced by having a family member or close friend who has had heart trouble.

Chapter VII

THE IMPACT OF SOCIOECONOMIC FACTORS ON THE HEALTH BELIEF MODEL

7.1 INTRODUCTION

Socioeconomic status (SES) has been included in the modified Health Belief Model as an exogenous factor. As such, SES may influence all of the dimensions of the HBM, as well as having a direct effect upon the health behavior. The Health Belief Model is based upon individual perceptions. These perceptions are shaped by the social standing of the individual. Haefner states that "The higher the SES level, the more likely a person is to possess preventively oriented health beliefs," (Haefner, in Becker, 1974:101).

In particular, willingness to follow professional advice is more characteristic of upper or middle class individuals than it is of working or lower class individuals. This is a key factor in health behavior, since suggestions of proper health behavior often come from health professionals. Kirscht states, "Belief in the efficacy of the various preventive and diagnostic actions tended to be positively associated with income and educational level," (Kirscht, et. al. 1966:253).

A "future orientation" is also associated with upper or middle class standing (Davidson, 1970:233). This type of orientation to the future is a necessary precondition for health behavior. The individual must believe that an action taken in the present will be of benefit to him or her in the future.

People in the lower or working class are less likely to believe a particular problem is preventable or controllable, due to a feeling of less control over life in general. The working or lower class person receives fewer positive sanctions from his or her social network regarding health behavior (Langlie, 1977:257). A willingness to overcome barriers associated with a particular health program (such as the cost in time and money of an exercise program), may also be lacking more often in the working or lower class individual. The barriers themselves may be stronger than for a middle or upper class person. For example, proper diet and medical care is harder to attain due to lack of money.

Childhood socialization is another factor that may link SES to health behavior. "It is sometimes asserted that the various social strata have differing health norms and values, that children in different social strata are socialized into particular styles of medical care values and behaviour by parental example, and that these styles carry over into adult life," (Coburn and Pope 1974). The present SES standing of a person is usually similar to the level of that per-

son's family of orientation. Therefore, SES level may influence current health behavior.

The relationship of SES factors to health behavior may also be partially explained by the alienation felt by people of lower SES levels. Poverty and low education levels are reinforced by the culture of poverty, which includes higher levels of feelings of powerlessness, hopelessness, and social isolation. These factors may be responsible for the time perspective of lower SES groups being limited to the present, rather than the future. A person who is preoccupied with the demands of the present will not likely undertake preventive health action, that offers better health in the future. Thus, factors such as alienation may lead to less frequent health behavior (Bullough 1972).

Coburn and Pope (1974) tested the relationship between several demographic and social psychological factors, (childhood SES, social participation, work self-direction, work constraints, powerfulness/powerlessness, health knowledge, occupation, education, income, age, childhood community size, immigrant generation, marital status, and religious preference), and three health behaviors (polio vaccination, medical examinations, and preventive dental visits). They found that SES had a "moderate impact" upon health behavior, with occupation being less important than income or education.

All of the explanatory variables were correlated in the proper direction, with health behavior, but the correlations were negligible or weak. None of the social psychological or demographic variables, other than SES factors, were successful in explaining much of the relationship between SES and health behavior. As a group, though, these factors explained about half of the variance. The best predictor of health behavior was education. Age was the second best overall predictor, but this was due to a strong relationship with polio vaccination. The next best predictors of health behavior were income and social participation.

7.2 SOCIOECONOMIC STATUS AND THE SOCIAL PSYCHOLOGICAL VARIABLES IN THE MODEL

7.2.1 Literature Review

A pioneering study of health beliefs was published in 1954 by Koos. The project was based in a rural community and lasted four years. The families in the study were visited at intervals "in an effort to learn their health habits, their attitudes toward health and illness, the relationships between the families and their sources of medical care and advice-from whatever type of source-and the use by these families of the institutions set up by the community to aid health" (Koos, 1954:5).

Koos was able to make the following statements concerning perceptions:

1. The individual's perceptions are shaped by his or her subculture of social class and family.
2. "Perception of health is undoubtedly influenced by the financial ability of the family to act in ways it might define as needed could it afford them," (Koos, 1954:139). If the individual could not afford the treatment to remedy or ease a health condition, it is considered as part of normal life.

In the years since the Koos study, there have been several studies that examined the relationship between SES factors and physical health. Measures such as morbidity, impairments, disability, mortality, infant mortality, and dental problems have been shown to be inversely related to social status (Lerner, 1969).

Levine (1962) reported that a relationship existed between educational levels and apprehension regarding several diseases.[63] Higher educational levels were associated with lower levels of fear regarding these diseases. It was hypothesized that a reason for this relationship may be that better educated people were more in control of their lives.

A nationwide survey of the U.S. was conducted by Kirscht, Haefner, Kegeles, and Rosenstock (1966). The sample consisted of 1493 adults, 21 years of age and older, living in private households. Urban, suburban, and rural residents

[63] The diseases that were studied were tuberculosis, birth defects, cancer, polio, cerebral palsy, and arthritis.

were represented. Four diseases were studied. They were cancer, tuberculosis, tooth decay, and gum disease. These diseases were chosen because of the range of "objective clinical severity and problems of continued and increasing public concern" they represented (Kirscht, et. al. 1966:249). Perceived susceptibility to these diseases was studied.

Having lower levels of formal education was associated with greater perceived susceptibility. The authors of the study noted that having less education is associated with having relatively little perceived control over events that effect the individual's life. This was seen as a reason why people with lower levels of education felt more susceptible to disease. Rosenstock (1975) also states that lower income groups are associated with high perceived susceptibility to disease.

Most of the literature regarding health behavior has assumed that a relationship between SES and internal locus of control exists. In the previous paragraphs on perceived susceptibility and SES, it was stated that people of higher SES levels believed themselves to be in more control of their lives (Levine, 1962; Kirscht, et. al. 1966). Rosenstock (1975) also states that lower income groups are also more likely to feel relatively powerless to alter their lives in many respects including health.

An assumption that is implicit in the Health Belief Model is that increased perceived susceptibility may be associated with an increased sense of control and a greater likelihood of health behavior. This demonstrates the class bias in the model. Middle class values such as a future orientation and a sense of control are assumed. Testing this relationship between SES factors and internal locus of control will determine if these data lend support to the hypothesis.

7.3 STATEMENT OF HYPOTHESES

The three hypotheses that will be examined in this section are:

1. SES is directly related to perceived health status.
2. SES is inversely related to perceived threat
3. SES is directly related to internal locus of control.

7.3.1 Operationalization of SES

In this study, three separate indicators of SES were used. These indicators are education, income, and occupation. The indicators were not combined into a scale of socioeconomic status. Each of these three measures was used to test the hypotheses.

Education was operationalized by the responses to a question regarding the highest level of education achieved by the respondent.[64] The responses were collapsed into four

[64] Question 50 Appendix B

categories: junior high or less, high school, technical/vocational training, and some university. The distribution of the sample by education was presented in Chapter Three (Table 3). People with some university education are somewhat over represented in the sample. This could lead to some problems in generalizeability. For example, levels of knowledge, for this sample, may be higher than for the general population.

Income was operationalized by responses to a question, which asked the respondent to indicate the family's total annual income.[65] The response categories were subsequently collapsed for the purposes of analysis (i.e., less than $10,000, $10,000-19,999, $20,000- 29,999, $30,000-39,999, $40,000-49,999, and $50,000 and over). The distribution of the sample by income was presented in chapter 3 (Table 4).

People in higher income brackets are somewhat over represented in the sample. This is generally a problem in survey research, as people in higher SES groups are usually more willing to participate. However, there are still sufficient numbers of people in the lower income and education groups to allow for comparison.

A final question asked of the respondents, to measure their SES, was the type of work they normally do.[66] The re-

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[65] Question 53 Appendix B

[66] Question 52 Appendix B

sponses were assigned a number using the Blishen Occupational Ranking. These scores were then collapsed into the six categories, suggested by Blishen and McRoberts (1976). The categories (and the percentage of the sample in each) are: 70 and over (3.1%); 60-69 (17.4%); 50-59 (23.8%); 40-49 (17.1%); 30-39 (17.0%); and under 30 (21.6%). The higher scores represent higher occupational prestige. Blishen refers to the categories as "classes". For example, the 70 and over group contains administrators, physicians, and university professors. The 40-49 group includes factory foremen, locomotive engineers, and nursery workers. Janitors, laborers, and taxi drivers are included in the 30 and under category. A comparison with some 1961 Manitoba data indicates that the sample is fairly representive.

7.3.2 Findings and Discussion

The probability values in Table 30 indicate that a statistically significant relationship exists between level of education and perceived health status. A person with a higher level of education is more likely to perceive his/her health status in positive terms. For example, 60.8% of the respondents with some university education rated themselves as healthy, while only 40.5% of the respondents with less than a junior high level of education rated themselves as healthy.

TABLE 30

PERCEIVED HEALTH STATUS BY LEVEL OF EDUCATION

PERCEIVED HEALTH STATUS (COL % / ROW %)	LEVEL OF EDUCATION: JR. HIGH OR LESS	HIGH SCHOOL	TECHNICAL/ VOCATIONAL	SOME UNIVERSITY	
UNHEALTHY	35	67	34	36	172
	16.7	19.6	18.3	13.7	17.2
	20.4	39.0	19.8	20.9	
MODERATE	90	108	48	67	313
	42.9	31.7	25.8	25.5	31.3
	28.8	34.5	15.3	25.5	
HEALTHY	85	166	104	160	515
	40.5	48.7	55.9	60.8	51.5
	16.5	32.2	20.2	31.1	
	210	341	186	263	1000
	21.0	34.1	18.6	26.3	

Chi square = 27.492

p = .0001

gamma = .166

There are some factors that may help to explain this relationship. A person with a higher educational level is more likely to be aware of health behaviors such as proper diet and exercise programs. Eating a proper diet and participating in exercise programs such as jogging, aerobics, and sports should lead to better "real" health and a higher level of perceived health status.

Table 31 shows the results of crosstabs of perceived health status and Blishen occupational groupings. As in the previous table, although the relationship is statistically significant, there is a weak association between these factors.[67] A person with a higher ranked occupation is more likely to have a more positive perceived health status. For persons in the "healthy" status the percentage in Blishen group 1 (the lowest group) is 40.2% and this figure rises at each level until Blishen group 6. This group does not fit the overall trend, but this could be due to the small number of respondents (24) in the group. Nevertheless, the trend is for perceived health status to improve as occupational rank increases.

The working conditions of the occupations could be responsible, in part, for this relationship. The occupations in the upper parts of the scale offer few health hazards for the individual. As the occupational level decreases, the health hazards of the job increase. These conditions may

[67] The value for gamma is .134.

TABLE 31

PERCEIVED HEALTH STATUS BY OCCUPATIONAL RANKING

COL %
ROW %

OCCUPATIONAL LEVEL

CEIVED HEALTH STATUS	(LOW) LESS THAN 30	30-39.9	40-49.9	50-59.9	60-69.9	(HIGH) 70 AND OVER	
UNHEALTHY	38	24	19	28	20	4	133
	23.2	18.8	14.6	15.2	14.9	16.7	17.4
	28.6	18.0	14.3	21.0	15.0	3.0	
MODERATE	60	41	35	52	34	11	233
	36.6	32.0	26.9	28.3	25.4	45.8	30.5
	25.8	17.6	15.0	22.3	14.6	4.7	
HEALTHY	66	63	76	104	80	9	398
	40.2	49.2	58.5	56.5	59.7	37.5	52.1
	16.6	15.8	19.1	26.1	20.1	2.3	
	164	128	130	184	134	24	764
	21.5	16.8	17.0	24.1	17.5	3.1	

Chi square = 19.573

p = .0336

gamma = .134

TABLE 32

PERCEIVED HEATLH STATUS BY INCOME

COL %
ROW %

RCEIVED HEALTH STATUS	INCOME: LESS THAN $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000-49,999	$50,000 AND OVER	
UNHEALTHY	29	45	33	12	11	15	145
	22.8	16.5	16.8	11.5	17.5	20.6	17.3
	20.0	31.0	22.8	8.3	7.6	10.3	
MODERATE	47	96	51	35	13	14	256
	37.0	35.2	25.9	33.6	20.6	19.2	30.6
	18.4	37.5	19.9	13.7	5.1	5.5	
HEALTHY	51	132	113	57	39	44	436
	40.2	48.4	57.4	54.8	61.9	60.3	52.1
	11.7	30.3	25.9	13.1	8.9	10.1	
	127	273	197	104	63	73	837
	15.2	32.6	23.5	12.4	7.5	8.7	

Chi square = 22.799

p = .0115

gamma = .142

have an affect upon perceived health status. In addition, Table 32 indicates that a relationship exists between family income level and perceived health status. A higher income will enable a person to engage in a healthier lifestyle. A higher financial standing makes it easier for a person to follow proper diet and other health maintenance practices. These factors will increase the person's perceived health status.

All three of the SES measures demonstrate the expected relationship with perceived health status. As SES increases, so does perceived health status. There are several factors that influence this relationship. As mentioned in the introduction to this chapter, factors such as a future orientation and a feeling of control are related to SES. As well, the overall lifestyle of people in higher SES groups is generally healthier than for people in lower SES groups. For example, better diet and social sanctions for health behaviors are more likely to occur in the higher SES levels. All of these factors have an influence upon perceived health status, as well as objective health status.

The data do not support the hypothesis that SES is inversely related to perceived threat of heart disease.[68] There is no statistically significant relationship between perceived susceptibility and any of the measures of SES. The gamma values are all very small and only education has a

[68] See Appendix A for tables.

negative value, which is consistent with the predicted direction of the relationship.

The lack of support for the hypothesis could be due to the disease itself. Heart disease may be perceived to occur in all SES levels. Therefore there may be no difference in perceived susceptibility found by education, income, or occupation.

In the literature, the relationship between SES factors and perceived susceptibility to heart disease has not been studied. For example, Mackie (1973), reports levels of perceived threat posed by heart disease, but does not analyze SES factors. According to the present study, perceived susceptibility to heart disease is not associated with SES. People in higher SES groups consider themselves to be just as likely to experience heart problems as the people in the lower SES groups.

Overall, the data do not support the hypothesis that SES is directly related to internal locus of control. The only statistically significant relationship is between income and internal locus of control. All of the gamma values are negligible. There is no clearly demonstrated relationship between SES and internal locus of control.[69]

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[69] The tables of education and occupation by internal locus of control are in Appendix A.

TABLE 33

INTERNAL LOCUS OF CONTROL BY INCOME

INTERNAL LOCUS OF CONTROL	INCOME: LESS THAN $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000-49,999	$50,000 AND OVER	
LOW	20	30	22	8	9	5	94
	15.9	11.3	11.2	7.8	14.5	6.8	11.4
	21.3	31.9	23.4	8.5	9.6	5.3	
MEDIUM	68	150	109	62	45	55	489
	54.0	56.6	55.6	60.2	72.6	75.3	59.3
	13.9	30.7	22.3	12.7	9.2	11.2	
HIGH	38	85	65	33	8	13	242
	30.2	32.1	33.2	32.0	12.9	17.8	29.3
	15.7	35.1	26.9	13.6	3.3	5.4	
	126	265	196	103	62	73	825
	15.3	32.1	23.8	12.5	7.5	8.8	

COL %
ROW %

Chi square = 22.632

p = .0122

gamma = -.047

The absence of support for the predicted relationship could, again, be due to the type of disease that is being studied. It has already been shown that SES is not related to perceived susceptibility to heart disease. It is logical to assume that if the people in the higher SES groups feel as susceptible to heart disease as the people in the lower SES groups, their internal locus of control scores will be similar.

Table 33 shows the crosstabs of income level by internal locus of control, and although statistically significant ($p=.01$), the relationship is not linear. Higher levels of income seem to be associated with moderate and not high locus of control beliefs. What is even more surprising is the low level of internal locus of control found among the two highest income groups. Nothing in the literature predicts such a result. Perhaps it is due to the limited number of people in these groups. This would mean that the relationship with the top two groups is not statistically significant. In addition, there could be some kind of response bias in this group, but there is no way of telling from these data.[70]

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[70] An example of response bias could be that when comparing themselves to their reference group, the people in the top categories do not believe that they have much control over their health. If this did occur, the scores for the people in the upper two groups would be lower than it would be if compared to the sample as a whole.

It has been stated that people in higher socioeconomic groups have more control over their lives. According to these data, that control, or more specifically perceived control, does not include personal belief in the individual's ability to prevent illness in general and heart disease more specifically.

7.4 SOCIOECONOMIC STATUS AND MODIFYING FACTORS

7.4.1 Literature Review

Ross (1962) studied two years of the U.S. National Health Survey (1957-1959) to establish relationships between social class and medical care. Social class was determined by family income and education of the head of the house. The type of medical care analyzed was visits to a physician. Ross states "as educational level rises, the amount of accurate information on etiology, symptoms, and treatment of common diseases is known to rise also" (Ross, 1962:39).

Rosenblatt and Suchman (1965) undertook a four year study of an ethnically mixed, urban population in New York City to determine working class attitudes and information regarding health and illness. In their report they state that working class people generally have less knowledge of illness, as measured by the responses to a series of questions dealing with various diseases. Rosenstock (1975) also states that lower income is associated with a lack of knowledge regarding health effects of insect and plant sprays, radioactive fallout, and fatty foods.

TABLE 34

Percentage of Canadians Reporting Heart Problems by Income Level

First quintile	6.4%	(Lowest income)
Second quintile	3.6	
Third quintile	3.1	
Fourth quintile	2.7	
Fifth quintile	3.1	(Highest income)
Mean	3.8%	

Table 34 shows the occurence of heart disease by income for Canadians, as reported by the Canada Health Survey (1981). An inverse relationship exists through the first four quintiles, with the fifth quintile (highest income) being equal to the middle income level (third quintile). Overall, higher income levels are related to lower rates of heart disease.

The lifestyle of the higher income groups is probably responsible for this trend. People with higher incomes will generally have less stress in their lives. They are less likely to have to worry about necessities. Also, higher income may mean more perceived control of a person's life, which results in less stress (Bullough 1972).

Social sanctions for health behaviors are usually greater in higher income groups (Langlie 1977). People in higher income groups are also less likely to be prevented from health behaviors, such as proper diet and exercise, by a lack of money.

7.4.2 Statement of Hypotheses

The two hypotheses to be analyzed in this section are:

1. SES is directly related to knowledge of the disease.
2. SES is not related to contact with the disease.

7.4.3 Findings and Discussion

The data in Table 35, Table 36, and Table 37 lend support to the hypothesis that SES is directly related to knowledge about heart disease. Higher education, occupation, and income levels are all associated with greater knowledge of heart disease.[71] The relationships are all significant at the .0001 or .0002 level and the measure of association is moderately strong (gamma ranges from .19 to .26).

The relative number of people who answered five or six of the items correctly, generally increases as education increases. The percentage of people who answered none to two items correctly decreases as education increases. The same relationships exist between knowledge and occupational level. However, the relationship between correct information and family income is not linear. People in the middle categories show the highest level of knowledge.

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[71] The tables for occupation and income contain too many cells with small numbers for the probability values to be considered valid, but the trend is clear. More crosstabs were calculated using a collapsed version of the knowledge variable (0, 1, and 2 correct answers were combined), to eliminate the sparse cells. The p and gamma values were virtually unchanged.

TABLE 35

KNOWLEDGE OF HEART DISEASE BY EDUCATION

COL %
ROW %

OWLEDGE OF HEART SEASE (NUMBER OF EMS ANSWERED RRECTLY)	EDUCATION: JR.HI.& LESS	H.S.	TEC./VOC.	SOME UNIVERSITY	
0	4 1.8 57.1	3 .9 42.9	0 .0 .0	0 .0 .0	7 .7
1	12 5.6 50.0	6 1.7 25.0	2 1.1 8.3	4 1.5 16.7	24 2.4
2	29 13.4 45.3	19 5.5 29.7	11 5.9 17.2	5 1.9 7.8	64 6.3
3	35 16.2 29.2	41 11.9 34.2	15 8.0 12.5	29 11.0 24.2	120 11.9
4	58 26.8 23.3	93 27.0 37.4	41 21.9 16.5	57 21.6 22.9	249 24.6
5	58 26.8 17.2	107 31.0 31.8	85 45.4 25.2	87 33.0 25.8	337 33.3
6	20 9.3 9.5	76 22.0 36.0	33 17.6 15.6	82 31.1 38.9	211 20.8
	216 21.3	345 34.1	187 18.5	264 26.1	1012

Chi square = 93.773

p = .0001

gamma = .262

TABLE 36

KNOWLEDGE OF HEART DISEASE BY OCCUPATIONAL LEVEL

OCCUPATIONAL LEVEL

EDGE OF DISEASE / ER OF ITEMS RED CTLY)	LESS THAN 30	30-39.9	40-49.9	50-59.9	60-69.9	70 AND OVER	
0	3 1.8 42.9	1 .8 14.3	1 .8 14.3	0 .0 .0	2 1.5 28.6	0 .0 .0	7 .9
1	5 3.0 31.2	5 3.8 31.2	3 2.3 18.8	2 1.1 12.5	1 .8 6.2	0 .0 .0	16 2.1
2	23 13.8 41.1	9 6.9 16.1	10 7.6 17.9	6 3.3 10.7	6 4.5 10.7	2 8.3 3.6	56 7.2
3	32 19.2 34.8	23 17.6 25.0	13 9.8 14.1	16 8.7 17.4	6 4.5 6.5	2 8.3 2.2	92 11.9
4	30 18.0 16.6	38 29.0 21.0	34 25.8 18.8	37 20.1 20.4	38 28.4 21.0	4 16.7 2.2	181 23.4
5	49 29.3 19.5	34 26.0 13.6	41 31.1 16.3	72 39.1 28.7	46 34.3 18.3	9 37.5 3.6	251 32.5
6	25 15.0 14.8	21 16.0 12.4	30 22.7 17.8	51 27.7 30.2	35 26.1 20.7	7 29.2 4.1	169 21.9
	167 21.6	131 17.0	132 17.1	184 23.8	134 17.4	24 3.1	772

Chi square = 66.094

p = .0002

gamma = .216

TABLE 37

KNOWLEDGE OF HEART DISEASE BY INCOME

COL %
ROW %

/LEDGE OF :T DISEASE IBER OF ITEMS /ERED ECTLY)	INCOME: UNDER $10,000	$10,000–19,999	$20,000–29,999	$30,000–39,999	$40,000–49,999	$50,000 AND OVER	
0	1 .8 20.0	4 1.4 80.0	0 .0 .0	0 .0 .0	0 .0 .0	0 .0 .0	5 .6
1	6 4.6 46.2	4 1.4 30.8	2 1.0 15.4	0 .0 .0	0 .0 .0	1 1.4 7.7	13 1.5
2	16 12.3 33.3	17 6.2 35.4	8 4.0 16.7	2 1.9 4.2	3 4.8 6.2	2 2.7 4.2	48 5.7
3	12 9.2 13.2	36 13.0 39.6	19 9.6 20.9	10 9.6 11.0	5 7.9 5.5	9 12.3 9.9	91 10.8
4	38 29.2 17.8	75 27.2 35.0	51 25.8 23.8	12 11.5 5.6	21 33.3 9.8	17 23.3 7.9	214 25.4
5	38 29.2 13.3	92 33.3 32.3	69 34.8 24.2	41 39.4 14.4	19 30.2 6.7	26 35.6 9.1	285 33.8
6	19 14.6 10.1	48 17.4 25.5	49 24.8 26.1	39 37.5 20.7	15 23.8 8.0	18 24.7 9.6	188 22.3
	130 15.4	276 32.7	198 23.5	104 12.3	63 7.5	73 8.6	844

Chi square = 65.377

p = .0002

gamma = .186

The relationship between SES factors and knowledge should have an affect upon health behavior. According to the Health Belief Model, modifying factors such as knowledge of disease will have a direct influence upon health behavior.[72] Therefore, some of the influence of SES factors, upon health behavior will be manifested indirectly by the level of knowledge.

Tables 38 and 39 show the results of crosstabs of education and income by direct contact with heart trouble. Both tables indicate statistically significant relationships (p=.0001). The measures of association are fairly strong (gamma=.293 and .341). No relationship existed between occupation and direct contact with heart problems.[73]

Direct contact with heart problems is especially prevalent in the lowest education group. Among people with junior high or less education, 19.1% reported having heart problems at some point. Fewer people in the other three educational level groups reported heart trouble, with technical/vocational being the highest of the three (6.5% for high school, 8.4% for technical/vocational, and 6.4% for university).

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[72] This relationship was not supported by the data for this study. See chapter 5.

[73] See Appendix A

TABLE 38

DIRECT CONTACT WITH HEART DISEASE BY EDUCATION

COL %
ROW %

DIRECT CONTACT WITH HEART DISEASE	EDUCATION: JUNIOR HI OR LESS	HIGH SCHOOL	TECHNICAL/ VOCATIONAL	SOME UNIVERSITY	
YES	34	21	15	16	86
	19.1	6.5	8.4	6.4	9.3
	39.5	24.4	17.4	18.6	
NO	144	301	164	233	842
	80.9	93.5	91.6	93.6	90.7
	17.1	35.8	19.5	27.7	
	178	322	179	249	928
	19.2	34.7	19.3	26.8	

Chi square = 25.917

p = .0001

gamma = .293

TABLE 39

DIRECT CONTACT WITH HEART DISEASE BY INCOME

COL %
ROW %

INCOME

DIRECT CONTACT WITH HEART DISEASE	UNDER $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000 49,999	$50,000 AND OVER	
YES	24	22	9	9	3	3	70
	21.0	8.5	4.8	9.1	5.1	4.4	8.9
	34.3	31.4	12.9	12.9	4.3	4.3	
NO	90	237	179	90	56	66	718
	79.0	91.5	95.2	90.9	94.9	95.6	91.1
	12.5	33.0	24.9	12.5	7.8	9.2	
	114	259	188	99	59	69	788
	14.5	32.9	23.9	12.6	7.5	8.8	

Chi square = 27.614

p = .0001

gamma = .341

The relationship between income and direct contact with heart trouble is similar to the association between education and heart problems. The lowest income group (under $10,000) shows a direct contact rate of 21.0%. The rates for the other groups ganges from 4.4% ($50,000 and over) to 9.1% ($30,000-$39,999).

These data indicate that people in the lowest educational and income groups are much more likely to experience heart problems. This is consistent with the hypothesis. The amount of stress in the lifestyle of persons with little education or money will make heart problems more prevalent. The middle education and income levels have fewer people reporting heart problems than the lowest group, although there does not seem to be a pattern of heart problems within the middle groups. People in the highest education level had the lowest rate of heart trouble, as did the respondents in the highest income bracket.

7.5 SOCIOECONOMIC STATUS AND HEALTH BEHAVIOR

7.5.1 Literature Review

The literature has been fairly consistent in support of this hypothesis. Health behaviors, actions to prevent a disease from occuring in the future are usually associated with higher levels of SES.

Koos (1954) found that social class was directly related to preventive examinations and dental care prophylaxis.

Suchman (1965) demonstrated that SES factors were more important than social group structure in determining the individual's medical orientation. For example, buying health insurance, getting a periodical medical check up, receiving polio immunizations, eating a balanced diet, and seeking dental care or eye examinations occur less frequently among lower SES groups.

Shostak and Gomberg (1972) found that working class people generally have less knowledge of illness, and are also less likely to engage in preventive behavior, than middle class people. Preventive medical care is "largely a development of the middle class culture of Western societies. It is only within these groups that one finds a fairly elaborated structure of routine prenatal and postnatal care, of pediatric services with immunizations, of detection of caries, and screening for TB, cancer, diabetes, and so forth," (Rosenblatt and Suchman in Shostak 1965:344). The middle class population has better knowledge of preventive health actions and more positive group sanctions for health behavior.

The lack of preventive health care could be another aspect of the lack of a future orientation among working class people. For example, less preventive maintainance of cars and household appliance is characteristic of the working class. "It is as though the white collar class thinks of the body as a machine to be preserved and kept in perfect

functioning condition, whether through prosthetic devices, rehabilitation, cosmetic surgery, or perpetual treatment, whereas blue collar groups think of the body as having a limited span of utility: to be enjoyed in youth and then to suffer with and to endure stoically with age and decrepitude. It may be that a more damaged self-image makes more acceptable a more damaged physical adjustment," (Rosenblatt and Suchman in Shostak 1965:344). Therefore the middle class, generally, has an attitude regarding health that is more likely to result in health behavior.

Another study of preventive health behavior was published in the fall of 1965, by Tyroler, Johnson, and Fulton. The first part of this study operationalized preventive health behavior as acceptance of an oral polio vaccine. Household interviews were conducted to measure response to an oral polio immunization program in Dade County, Florida, in 1960. The respondents were drawn from a probability sample of households where both parents were under forty years of age and resided in the household with one preschool child. It was found that the members of the families were likely to show similar behavior. That is, all members of the family were vaccinated or none were vaccinated. (In families where there was a difference between family members regarding health behavior, the highest correlation occured between the mother and the child.) This similarity of behavior generally occured despite differences in class. Higher SES was correlated to vaccination.

Part two of the Tyroler, Johnson, and Fulton paper dealt with levels of carious tooth salvage. The data were collected from a North Carolina statewide household survey of dental health. The parents in the sample were aged from 30-39 years and resided in the household with at least one child with some permanent teeth, and each family member showed evidence of dental caries activity. The families tended to have similar levels of tooth salvage across social and ethnic lines. (There was evidence of maternal determination of family patterns.) Being white and being a member of higher social classes was correlated with preventive behavior.

Rosenstock (1975) sought to explain the relationship between SES and health behavior. He stated that certain beliefs may be required to exhibit health behavior and these beliefs are more prevalent in the higher income individual, in particular the higher income whites, women, better educated, and relatively young.

Two main factors are necessary for the individual to exhibit health behavior. These factors are a knowledge of the disease and a future orientation which are both associated with higher SES. The upper and middle income groups place more emphasis on health and the medical system, in turn, is geared to the middle class. The lower income groups are also more likely to feel relatively powerless to alter their lives in many respects including health.

It was discovered that people in the lower SES groups were less likely to brush their teeth. Brushing teeth is less expensive than many other health behaviors, so lack of money needed for the health behavior should not be a factor in the health behavior decision. The person does not have to enter a professional referal system that may be geared to the middle class. Therefore, this particular relationship between income and health behavior is probably not due to relative availability of the health behavior, by income level. It is more likely that factors such as a lack of knowledge regarding health, low perceived efficacy of treatments, as well as beliefs in susceptibility, severity, and benefits of health behaviors are responsible for the relationship. These factors were all found to be related to lower income.

Several other studies have noted a relationship between SES and health behavior. Higher income, education, and occupational status were found to be related to preventive dentist visits for children (Kegeles 1963:167). An article reviewing several studies noted that the use of health services for preventive purposes was related to better education and higher income (Rosenstock 1966). Income levels of sugar cane workers was related to use of a protective glove (Suchman 1967). Antonovsky and Kats called SES a "conditioning type" of variable in their model to explain health behavior. That is, SES conditions the other variables in their model, such as motivation and perceived blocks to health behavior.

Langlie (1977) also demonstrated a relationship between education, income, family SES, and neighborhood SES with "indirect risk" health behavior. Indirect risk health behaviors are actions taken to prevent a health problem, where the risk is not immediate. They include actions such as medical check-ups, dental care, and immunizations. The SES factors were related to "direct risk" health behaviors only for people who were seen as displaying "inconsistent" behavior.[74] (These people scored high on some health behaviors and low on others.) For the people in the "consistent" group, (consistent in relation to health behaviors) there was no relation between the SES factors and direct risk health behaviors.

Fink et al (1972) studied the reaction to an offer for free breast examinations made to a number of women in an urban center. Acceptance of the exam was defined as exhibiting health behavior. It was found that the participants in the examination program were more likely to be members of "an upper social status", as measured by education, income, and employment.

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[74] Direct risk behaviors were: driving behavior, pedestrian behavior, personal hygiene, and smoking behavior.

7.5.2 Statement of Hypothesis

The specific hypothesis to be analyzed in this section is: SES is directly related to health behavior.

7.5.3 Findings and Discussion

For this study, smoking behavior is the health behavior that was analyzed. The decision to never smoke, or to quit smoking is seen as an action to maintain health or prevent disease. Crosstabs were calculated for the demographic variables (education, occupation, and income) with smoking behavior. Table 40 shows the results of the crosstabulation of education and smoking behavior.

Overall, a statistically significant relationship exists between education and smoking behavior (p=.0014), but the association is not a strong one, (lambda=.01382). Yet, the data reveal some interesting trends.

For example, among people who have never smoked, the greatest percentage are people with some university education, (36.3%), as would be predicted by the Health Belief Model. However, among ex-smokers, the highest proportion consists of people with junior high education or less (36.0%). The educational levels of current smokers also reflects this curvilinear relationship. The groups with the highest proportion of smokers are technical/vocational training (44.5%) and high school (47.9%). The groups with the lowest proportion of current smokers are junior high or

TABLE 40

SMOKING BEHAVIOR BY EDUCATION

COL %
ROW %

EDUCATION

SMOKING BEHAVIOR	JUNIOR HI OR LESS	HIGH SCHOOL	TECHNICAL/ VOCATIONAL	SOME UNIVERSITY	
NEVER SMOKED	58	100	53	94	305
	28.6	29.8	29.1	36.3	31.1
	19.0	32.8	17.4	30.8	
EX-SMOKERS	73	75	48	78	274
	36.0	22.3	26.4	30.1	28.0
	26.6	27.4	17.5	28.5	
SMOKERS	72	161	81	87	401
	35.5	47.9	44.5	33.6	40.9
	18.0	40.2	20.2	21.7	
	203	336	182	259	980
	20.7	34.3	18.6	26.4	

Chi square = 21.613

p = .0014

lambda = .005

less (35.5%) and some university (33.6%). Years of formal education completed does not seem to have a direct effect on smoking behavior.

Table 41 shows crosstabulations of occupation by smoking behavior. A statistically significant relationship does not exist between these two variables (p=.1925). Yet, a few observations may be made. The two lowest occupational groups show the lowest percentage of people who have never smoked, (22.2 and 25.6%), while groups 3 and 4 have the highest percentage, (32.3 and 33.9%). These middle occupational groups also have the lowest proportion of ex-smokers (26.0 and 20.3%). Group 6 (the highest ranking occupations) has the largest proportion of ex-smokers, but there are only 24 people in this group, so any analysis is tenuous. The proportions for current smokers are similar across all the occupational groups except for group 6, which is much lower.

Crosstabs of income by smoking behavior are shown in Table 42. A statistically significant relationship exists (p=.03394), but the value for lambda is .000. The income groups with the highest proportion of people who have never smoked are those who reported family incomes between $20,000 and $40,000. The income groups with the highest proportion of current smokers are the three lowest groups, with the $20,000-29,999 group being the highest at 46.7%. The proportion of smokers decreases for the top three income groups from 38.2% for the $30,000-39,999 group to 32.9% for the

TABLE 41

SMOKING BEHAVIOR BY OCCUPATIONAL LEVEL

COL %
ROW %

OCCUPATIONAL LEVEL

SMOKING BEHAVIOR	LESS THAN 30	30-39.9	40-49.9	50-59.9	60-69.9	70 AND OVER	
NEVER SMOKED	35	33	41	60	37	7	213
	22.2	25.6	32.3	33.9	27.8	29.2	28.5
	16.4	15.5	19.2	28.2	17.4	3.3	
EX-SMOKERS	48	36	33	36	41	10	204
	30.4	27.9	26.0	20.3	30.8	41.7	27.3
	23.5	17.6	16.2	17.6	20.1	4.9	
SMOKERS	75	60	53	81	55	7	331
	47.5	46.5	41.7	45.8	41.4	29.2	44.2
	22.7	18.1	16.0	24.5	16.6	2.1	
	158	129	127	177	133	24	748
	21.1	17.2	17.0	23.7	17.8	3.2	

Chi square = 13.590

p = .1925

lambda = .021

TABLE 42

SMOKING BEHAVIOR BY INCOME

INCOME

COL %
ROW %

SMOKING BEHAVIOR	LESS THAN $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000-49,999	$50,000 AND OVER	
NEVER SMOKED	45	87	43	26	22	20	243
	36.6	32.3	22.0	25.5	35.5	28.6	29.6
	18.5	35.8	17.7	10.7	9.0	8.2	
EX-SMOKERS	28	66	61	37	17	27	236
	22.8	24.5	31.3	36.3	27.4	38.6	28.8
	11.9	28.0	25.8	15.7	7.2	11.4	
SMOKERS	50	116	91	39	23	23	342
	40.6	43.1	46.7	38.2	37.1	32.9	41.7
	14.6	33.9	26.6	11.4	6.7	6.7	
	123	269	195	102	62	70	821
	15.0	32.8	23.8	12.4	7.6	8.5	

Chi square = 19.065

p = .0394

lambda = .000

group with income of over $50,000. The distribution of smokers by income is the only finding that approaches the linear relationship predicted by the Health Belief Model between socioeconomic status and health behavior.

7.6 CONCLUSION

The SES factors did have some influence on parts of the modified Health Belief Model. Relationships were demonstrated between the SES factors and perceived health status, knowledge about heart disease, and direct contact with heart disease. (No relationships were found between the SES variables and internal locus of control or perceived threat of heart disease.) Measures of association were consistently low. A correlation matrix of all of the variables in the model revealed only two relationships, between an SES variable and one of the dimensions of the HBM with a Pearson's R of .2 or better.[75]

The demographic variables (education, occupation, and income) were added to the social psychological factors, modifying factors, and cue to action, to complete all of the independent variables in the modified Health Belief Model and a stepwise multiple regression was then run with smoking behavior as the dependent variable. The addition of the demographic variables only increased R square from .00507 to

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[75] These relationships were education and knowledge of heart disease (.25) and occupation and knowledge of heart disease (.22).

.01163. Clearly, the model does not explain much of the variance of smoking behavior.

The lack of support for the hypotheses is probably due to the nature of the health behavior that was studied. Smoking behavior does not seem to be as rational a decision as other health behaviors, such as medical check-ups, exercise programs, or diets. There are several other factors that contribute to the smoking behavior decision. Smoking behavior of parents, or caretakers, contributes a great deal to how the child comes to view smoking. A child who is raised in an environment in which role models smoke will learn to view smoking as a "natural" behavior, no matter what the SES of the people involved.

As the child becomes older, peer pressure will influence his or her smoking behavior. During adolescence, smoking behaviors may be established that will continue for years. In adult life, the tension and pressure of day to day activities will contribute to smoking behavior. The tension may come from the person's occupation. People who work under pressure are probably more likely to smoke, or will find it harder to quit smoking. Personal life may also be a source of tension. In this study, a significant relationship was found between marital status and smoking behavior, with separated and divorced people being more likely to smoke. In future studies of this subject, ways of measuring smoking behavior of significant others, and tension in daily life

would probably increase the efficiency of the model for explaining smoking behavior.

Chapter VIII

SUMMARY AND CONCLUSIONS

8.1 SMOKING CHANGE AS A HEALTH BEHAVIOR

An effort to quit smoking, even if unsuccessful, may be seen as a health behavior. The individual perceives that smoking cessation will improve his or her health and/or will decrease the chance of disease. By the same reasoning a decrease in the amount smoked or the strength of cigarettes smoked could be seen as a health behavior.

Respondents who currently smoke were asked if they had tried to alter their smoking behavior during the previous 12 months.[76] The responses to these questions make it possible to determine if the respondent had made an effort to cut down on the amount or strength of cigarettes smoked or if the person had tried to quit smoking within the previous twelve months.

The responses to question #25 (Appendix B) were used to create three groups, in relation to change in smoking behavior:

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[76] Questions #25 and 26 in Appendix B

1. People who are smoking less and/or have switched to a milder brand of cigarettes
2. People who have not changed their smoking behavior, or show inconsistent changes, such as switching to a milder brand of cigarettes, but smoking more cigarettes
3. People who are smoking more and/or have switched to a stronger brand of cigarettes

Crosstabulations of all of the variables in the modified HBM with the smoking change variables were calculated. Only one statistically significant relationship emerged. Smoking change was found to be related to education (p=.009), but the lambda value was only .053, indicating a weak relationship.

A stepwise multiple regression was calculated with each of the smoking change measures as the dependent variables. All of the dimensions of the modified Health Belief Model were treated as independent variables in the regression analysis. The first dependent variable used was attempted smoking cessation.[77] The highest correlation coefficient for the dependent variable and any independent variable was only -.089. The R square for the total regression was only .018. Clearly, the variables in the model do not explain much of the variance in attempts at smoking cessation.

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[77] Calculated by response to question #26, Appendix B (applicable to current smokers only): "Have you tried to stop smoking during the past 12 months?"

Change in smoking behavior was also used as the dependent variable in a multiple regression, with all of the independent variables derived from the model forced into the regression. The largest correlation coefficient for any variable with the dependent variable was only -.119.[78] The R square for the regression was only .043. Again, the model was not successful in explaining much of the variance in changes in smoking behavior amongst smokers.

8.2 UNEXPLAINED VARIANCE

Thus, very little of the variance in smoking behavior was explained by the variables in the modified HBM. There were several hypotheses in the model that were supported by the data. Yet, only two of the hypotheses related to smoking behavior were found to be statistically significant, and even then the explained variance was very small. The relationships of the other variables with smoking behavior were very weak.

The lack of explained variance could be due to several things. Obviously, some major factors that influence smoking behavior were not measured. The scope of this project did not allow for analysis of parent or caretaker attitudes toward smoking, peer pressure, physical and/ or psychological addiction to cigarettes, stress in lifestyle (and the ability to deal with stress), and other factors that may in-

[78] Higher occupational rank was related to smoking less or switching to a milder brand.

fluence smoking behavior.

The manner in which some of the variables were operationalized could also be responsible for part of the unexplained variance. As stated in previous sections, the general lack of a perceived connection between smoking and heart disease may be partially responsible for the lack of explained smoking behavior. If the modifying factors, the social psychological factors, and the cues to action were tested in relation to lung cancer, perhaps more of the variance in smoking behavior might have been explained.

It is also possible that the HBM is not appropriate for analyzing smoking as a health behavior. The HBM, in whole and in part, has been tested with a wide range of health behaviors since the late 1950's. It has generally been found to be a good model for explaining certain types of health behavior. Yet, the nature of the smoking decision is such that it may not be appropriate to use the HBM. Some of the factors included in the modified Health Belief Model, such as internal locus of control or perceived threat of heart disease may not have much influence on the smoking decision. As mentioned previously, there are several major factors in the smoking decision, such as role model smoking behavior and stress, that are not included in the modified Health Belief Model.

One method of improving studies using the HBM to explain smoking behavior, would be to determine when smoking cessation or abstinance is a health behavior. In the present study, all non-smokers are seen as exhibiting health behavior. Some people quit smoking, or never start, due to the presence of an illness. This situation would be defined as illness or sick role behavior. The variables in the HBM are designed to explain health behavior. If that were the only type of smoking behavior anlyzed, perhaps the model would explain more of the variance.

Future research in the area of explaining smoking behavior must deal with the issues discussed in this section. Other factors that influence smoking behavior should be included in any new theoretical model or modified HBM. The effect of family and peer attitudes toward smoking, the effect of stress upon smoking, and other possible variables should be investigated. The smoking behavior decision is influenced by many factors and it is only through more research that this decision will be better understood.

Appendix A

NON-SIGNIFICANT FINDINGS

DIRECT CONTACT WITH HEART DISEASE BY OCCUPATIONAL LEVEL

OCCUPATIONAL LEVEL

COL %
ROW %

DIRECT CONTACT WITH HEART DISEASE	LESS THAN 30	30-39.9	40-49.9	50-59.9	60-69.9	70 AND OVER	
YES	15	9	8	10	9	3	54
	10.1	7.4	6.7	5.8	6.9	13.0	7.5
	27.8	16.7	14.8	18.5	16.7	5.6	
NO	134	112	112	162	122	20	662
	89.9	92.6	93.3	94.2	93.1	87.0	92.5
	20.2	16.9	16.9	24.5	18.4	3.0	
	149	121	120	172	131	23	716
	20.8	16.9	16.8	24.0	18.3	3.2	

Chi square = 3.316

p = .6514

gamma = .080

OCCUPATIONAL LEVEL BY INTERNAL LOCUS OF CONTROL

COL %
ROW %

OCCUPATIONAL LEVEL

INTERNAL LOCUS OF CONTROL	LESS THAN 30	30-39.9	40-49.9	50-59.9	60-69.9	70 AND OVER	
LOW	19	15	10	22	14	2	82
	11.7	11.9	7.9	12.2	10.6	8.3	10.9
	23.2	18.3	12.2	26.8	17.1	2.4	
MEDIUM	102	69	71	115	85	14	456
	62.6	54.8	56.4	63.9	64.4	58.3	60.7
	22.4	15.1	15.6	25.2	18.6	3.1	
HIGH	42	42	45	43	33	8	213
	25.8	33.3	35.7	23.9	25.0	33.3	28.4
	19.7	19.7	21.1	20.2	15.5	3.8	
	163	126	126	180	132	24	751
	21.7	16.8	16.8	24.0	17.6	3.2	

Chi square = 9.389

p = .4956

gamma = -.020

INTERNAL LOCUS OF CONTROL BY EDUCATION

EDUCATION

COL %
ROW %

INTERNAL LOCUS OF CONTROL	JUNIOR HI OR LESS	HIGH SCHOOL	TECHNICAL/ VOCATIONAL	SOME UNIVERSITY	
LOW	24	43	16	30	113
	11.5	13.0	8.7	11.4	11.5
	21.2	38.0	14.2	26.6	
MEDIUM	124	196	107	155	582
	59.6	59.0	58.5	58.9	59.0
	21.3	33.7	18.4	26.6	
HIGH	60	93	60	78	291
	28.8	28.0	32.8	29.7	29.5
	20.6	32.0	20.6	26.8	
	208	332	183	263	986
	21.1	33.7	18.6	26.7	

Chi square = 2.799

p = .8337

gamma = .029

PERCEIVED THREAT BY OCCUPATIONAL LEVEL

COL %
ROW %

OCCUPATIONAL LEVEL

PERCEIVED THREAT	LESS THAN 30	30-39.9	40-49.9	50-59.9	60-69.9	70 AND OVER	
LOW	49	29	23	43	27	4	175
	34.5	25.2	19.7	25.6	21.8	19.0	25.5
	28.0	16.6	13.1	24.6	15.4	2.3	
MEDIUM	71	69	78	109	79	16	422
	50.0	60.0	66.7	64.9	63.7	76.2	61.4
	16.8	16.4	18.5	25.8	18.7	3.8	
HIGH	22	17	16	16	18	1	90
	15.5	14.8	13.7	9.5	14.5	4.8	13.1
	24.4	18.9	17.8	17.8	20.0	1.1	
	142	115	117	168	124	21	687
	20.7	16.7	17.0	24.4	18.0	3.1	

Chi square = 15.712

p = .1082

gamma = .052

PERCEIVED THREAT BY INCOME

COL %
ROW %

INCOME

PERCEIVED THREAT	UNDER $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000-49,999	$50,000 AND OVER	
LOW	24 24.7 12.7	70 28.9 37.0	47 25.1 24.9	14 15.4 7.4	12 20.7 6.4	22 31.9 11.6	189 25.4
MEDIUM	58 59.8 12.7	138 57.0 30.2	116 62.0 25.4	67 73.6 14.7	38 65.5 8.3	40 58.0 8.8	457 61.4
HIGH	15 15.5 15.3	34 14.0 34.7	24 12.8 24.5	10 11.0 10.2	8 13.8 8.2	7 10.1 7.1	98 13.2
	97 13.0	242 32.5	187 25.1	91 12.2	58 7.8	69 9.3	744

Chi square = 11.132

p = .3473

gamma = .006

PERCEIVED THREAT BY EDUCATION

COL %
ROW %

EDUCATION

PERCEIVED THREAT	JUNIOR HI. OR LESS	HIGH SCHOOL	TECHNICAL/ VOCATIONAL	SOME UNIVERSITY	
LOW	42	79	42	67	230
	26.1	25.2	24.8	28.0	26.0
	18.3	34.4	18.3	29.1	
MEDIUM	91	192	105	148	536
	56.5	61.2	62.1	61.9	60.7
	17.0	35.8	19.6	27.6	
HIGH	28	43	22	24	117
	17.4	13.7	13.0	10.0	13.2
	23.9	36.8	18.8	20.5	
	161	314	169	239	883
	18.2	35.6	19.1	27.1	

Chi square = 5.133

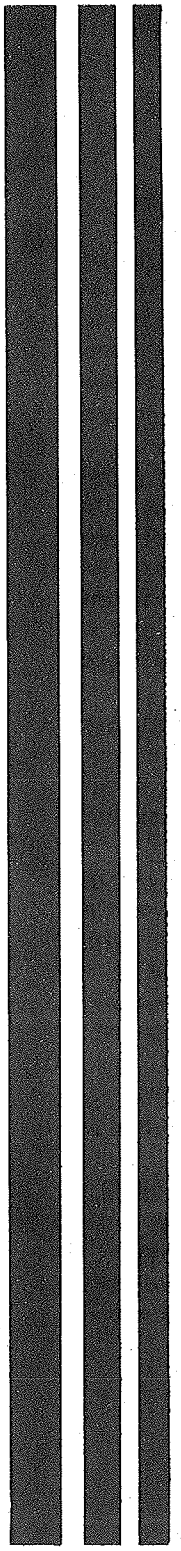
p = .5269

gamma = -.067

Appendix B

QUESTIONNAIRE

0896



CARDIOVASCULAR HEALTH SURVEY

INSTITUTE FOR SOCIAL AND ECONOMIC RESEARCH
Faculty of Arts
The University of Manitoba

WHO ARE WE?

The Institute for Social and Economic Research is located in the Faculty of Arts at the University of Manitoba. It engages in social science research, and undertakes such investigation for a number of agencies. This research is being conducted with a grant from the Canadian Heart Foundation (Ottawa).

WHAT IS THIS SURVEY FOR?

Health and illness concern us all. These questions are designed to provide university researchers with detailed information on ordinary Manitoban's beliefs, attitudes and personal behaviour related to cardiovascular health. This research will provide a better basis for long term planning and for developing more effective health education programs.

WHERE DID WE GET YOUR NAME?

Your name and address were selected randomly by a computer from the Manitoba Health Services Commission records. A total of 1800 Manitoba residents have received this questionnaire.

WHAT WILL BE DONE WITH THE QUESTIONNAIRES?

The information will be placed on computer tape, and once we have checked to see that the recording was done correctly, this questionnaire will be destroyed. All survey research at the University of Manitoba is supervised by an ethical review board to protect your privacy. ALL OF THE INFORMATION YOU GIVE US IS CONFIDENTIAL.

WILL I EVER BE ABLE TO SEE THE RESULTS?

Yes, early next spring you will receive a copy of the summary report.

WHY SHOULD I ANSWER?

We know that you are busy and many people seem to be asking you questions, but we think your opinions are valuable. This is your chance to register your opinions on a matter of importance to Manitobans and to influence health education policy and programs.

1. How important do you believe each of the following factors is to maintaining your overall health? Please circle the appropriate response to each item.

	Very Important	Somewhat Important	Not at all Important
REGULAR EXERCISE	1	2	3
TAKING VITAMINS	1	2	3
PRAYER OR FAITH	1	2	3
HAVING CLOSE FRIENDS	1	2	3
AVOIDING STRESS	1	2	3
LUCK OR FATE	1	2	3
GENETIC CONSTITUTION	1	2	3
DIET AND NUTRITION	1	2	3
POSITIVE THINKING	1	2	3
AVOIDING GERMS	1	2	3
AVOIDING SMOKING	1	2	3
USING CAR SEAT BELTS	1	2	3
ROUTINE MEDICAL CHECK-UPS	1	2	3

2. Here are four statements that people make to describe why they believe they are in good health. Please rank these statements from 1 to 4, by placing 1 beside the most important, 2 beside the second most important, and so on.

	(Rank 1 to 4)
BEING ASSURED BY A DOCTOR THAT YOU HAVE NO EVIDENCE OF DISEASE	____
HAVING NO DISCOMFORT OR SYMPTOMS	____
BEING ABLE TO PERFORM THE USUAL TASKS OF DAILY LIVING	____
HAVING A FEELING OF GENERAL WELL-BEING	____

1. The following statements are designed to help us learn about your opinions regarding health and illness in general. Please indicate whether you agree or disagree with each statement by circling the appropriate number beside each item.

	Strongly Agree	Agree	Un-Decided	Disagree	Strongly Disagree
GETTING WELL IS OFTEN A MATTER OF CHANCE	1	2	3	4	5
MOST SICK PEOPLE ARE HELPED BY DOCTORS	1	2	3	4	5
PEOPLE'S ILL HEALTH RESULTS FROM THEIR OWN CARELESSNESS	1	2	3	4	5
I CAN'T DO MUCH FOR MYSELF WHEN I'M SICK	1	2	3	4	5
THERE IS VERY LITTLE I CAN PERSONALLY DO TO ALTER MY CHANCES OF GETTING HEART DISEASE	1	2	3	4	5
PEOPLE WHO NEVER GET SICK ARE JUST PLAIN LUCKY	1	2	3	4	5
RECOVERY FROM ILLNESS REQUIRES GOOD MEDICAL CARE	1	2	3	4	5
ONE CAN DO LITTLE TO PREVENT ILLNESS	1	2	3	4	5
I CAN CURE MYSELF WHEN I'M SICK	1	2	3	4	5
MY LIVING HABITS HAVE A MAJOR INFLUENCE ON MY CHANCES OF HAVING A HEART ATTACK	1	2	3	4	5
GOOD HEALTH IS LARGELY A MATTER OF GOOD FORTUNE	1	2	3	4	5
REGULAR MEDICAL CHECK-UPS ARE THE KEY TO HEALTH	1	2	3	4	5
PEOPLE WHO TAKE CARE OF THEMSELVES STAY HEALTHY	1	2	3	4	5

Cont'd. ...	Strongly Agree	Agree	Un-Decided	Disagree	Strongly Disagree
WHENEVER I GET SICK IT IS BECAUSE OF SOMETHING I'VE DONE OR NOT DONE	1	2	3	4	5
IF I HAVE A FAMILY HISTORY OF HEART TROUBLE, I SHOULD BE PARTICULARLY CAREFUL ABOUT MY DIET, SMOKING AND EXERCISE HABITS	1	2	3	4	5
THERE ARE SO MANY STRANGE DISEASES AROUND THAT YOU CAN NEVER KNOW HOW OR WHEN YOU MIGHT PICK ONE UP	1	2	3	4	5
DOCTORS CAN DO LITTLE TO PREVENT ILLNESS	1	2	3	4	5
NO MATTER HOW CAREFUL ONE IS, PEOPLE CAN EXPECT A GOOD DEAL OF SICKNESS IN THEIR LIFETIME	1	2	3	4	5
WHEN I FEEL ILL, I KNOW IT IS BECAUSE I HAVE NOT BEEN GETTING THE PROPER EXERCISE OR EATING RIGHT	1	2	3	4	5
I DON'T NEED TO WORRY ABOUT HEART DISEASE BECAUSE IT CAN BE CURED BY SURGERY	1	2	3	4	5
NO MATTER WHAT I DO, IF I AM GOING TO GET SICK, I WILL GET SICK	1	2	3	4	5
DOCTORS RELIEVE OR CURE FEW MEDICAL PROBLEMS	1	2	3	4	5
WHEN A PERSON IS SICK, THERE IS VERY LITTLE HE/SHE CAN DO TO GET WELL	1	2	3	4	5
IF I TAKE CARE OF MYSELF, I CAN AVOID ILLNESS	1	2	3	4	5
MEDICAL EVIDENCE IS CONTRADICTORY AND THEREFORE IT IS NOT WORTHWHILE TO ATTEMPT TO PREVENT HEART ATTACKS	1	2	3	4	5

4. Which of the following terms do you believe refer to heart problems? Check the appropriate response for each term.

	Yes	No	Don't Know
ANGINA PECTORIS	___	___	___
ATHEROSCLEROSIS	___	___	___
CHOLECYSTITIS	___	___	___
CORONARY THROMBOSIS	___	___	___
HYPERTENSION	___	___	___
MYASTHENIA	___	___	___
MYOCARDIAL INFARCTION	___	___	___
PULMONARY EMBOLISM	___	___	___

5. Please indicate whether you believe each of the following statements about heart problems is True or False by checking the appropriate response beside each statement.

	True	False	Don't Know
HEART DISEASE IS HEREDITARY	___	___	___
MOST HEART ATTACKS ARE FATAL	___	___	___
HIGH BLOOD PRESSURE CAN BE CONTROLLED BY DRUGS	___	___	___
HARDENING OF THE ARTERIES CAN BEGIN AT QUITE AN EARLY AGE	___	___	___
A STROKE IS THE SAME THING AS A HEART ATTACK	___	___	___
WHEN THE HEART SKIPS BEATS, IT IS USUALLY SERIOUS	___	___	___

For the following questions, please check the response which you believe is correct.

6. Heart problems generally

- CAUSE VERY LITTLE PAIN ___
- CAUSE SOME PAIN ___
- CAUSE EXTREME PAIN ___
- DON'T KNOW ___

7. Heart problems generally

- RESULT IN PERMANENT DISABILITY ___
- RESULT IN TEMPORARY DISABILITY ___
- RESULT IN NO DISABILITY ___
- DON'T KNOW ___

8. Heart problems

- RARELY CAUSE DEATH ___
- SOMETIMES CAUSE DEATH ___
- USUALLY CAUSE DEATH ___
- DON'T KNOW ___

9. Three major causes of death among Canadians are listed below. Please rank these causes by placing 1 beside the cause of most deaths, 2 beside the cause of the second greatest number of deaths, and 3 beside the cause of the fewest number of deaths.

(Rank 1 to 3)

- CANCER ___
- ACCIDENTS ___
- DISEASES OF THE HEART ___

10. How widespread do you believe heart problems are? Check one response.

- MANY PEOPLE WILL HAVE HEART PROBLEMS ___
- SOME PEOPLE WILL HAVE HEART PROBLEMS ___
- ALMOST NOBODY WILL HAVE HEART PROBLEMS ___
- DON'T KNOW ___

IF YOU HAVE EVER HAD HEART TROUBLE, SKIP TO QUESTION #14
IF YOU HAVE NEVER HAD HEART TROUBLE, CONTINUE WITH QUESTION #11.

11. How likely do you believe it is that you will develop heart trouble sometime in the future? (Circle the number of the appropriate response).

Very Likely				Very Unlikely
1	2	3	4	5

12. How concerned are you about developing heart trouble?

Very Concerned				Not at all Concerned
1	2	3	4	5

13. How frequently do you think about getting heart trouble?

Very Frequently				Never
1	2	3	4	5

14. How often would the following complaints make you suspect that a person is having a heart attack. (Check the appropriate response for each complaint).

	Always	Sometimes	Never	Don't Know
HEAVINESS "LIKE A TON OF WEIGHT" ON THE CHEST	___	___	___	___
PERSISTENT UPPER ABDOMINAL PAIN WITH MARKED WEAKNESS AND SWEATING	___	___	___	___
MILD CHEST PAIN WITH "ACHING" IN THE JAW AND DOWN THE LEFT ARM	___	___	___	___
SHARP "LIGHTNING-LIKE" PAINS UNDER THE LEFT NIPPLE	___	___	___	___
ANY SUDDEN, PERSISTENT CENTRAL CHEST PAIN	___	___	___	___

15. What do you think is the most dangerous period after a heart attack? (Check one response).

THE FIRST TWO HOURS	____
THE FIRST DAY	____
THE FIRST WEEK	____
DON'T KNOW	____

16. To get to emergency medical help most quickly after a heart attack, one should (Check one response).

PHONE ONE'S FAMILY PHYSICIAN AND REQUEST A HOUSE CALL	____
CALL AN AMBULANCE	____
GO IMMEDIATELY TO THE NEAREST HOSPITAL EMERGENCY ROOM	____
DON'T KNOW	____

17. In Winnipeg, an ambulance with trained emergency medical technicians can be summoned immediately by dialing:

999	____
911	____
0	____
411	____
ZENITH 50000	____
DON'T KNOW	____

18. In rural Manitoba, help from Police, Fire Department, or Ambulance service can be reached by dialing:

999	____
911	____
0	____
411	____
ZENITH 50000	____
DON'T KNOW	____

19. How important do you believe each of the following factors is in increasing a person's chances of having heart problems? (Check one response for each factor)

	Very Important	Somewhat Important	Not Important	Don't Know
A FAMILY HISTORY OF HEART PROBLEMS	___	___	___	___
SMOKING CIGARETTES	___	___	___	___
ELEVATED BLOOD PRESSURE	___	___	___	___
HIGH CHOLESTEROL DIET	___	___	___	___
DRINKING COFFEE	___	___	___	___
BEING OF THE MALE SEX	___	___	___	___
BEING OVERWEIGHT	___	___	___	___
A LACK OF EXERCISE	___	___	___	___
A STRESSFUL JOB	___	___	___	___
ANXIETY AND TENSION	___	___	___	___

FOR THE FOLLOWING QUESTION WE WOULD LIKE TO KNOW HOW LIKELY YOU ARE TO ACT ON THE INFORMATION THAT YOU RECEIVE ABOUT HEALTH FROM THESE DIFFERENT SOURCES.

20. Please check the appropriate response for each source. (Check N.A. - Not Applicable - if you do not receive any information from the particular source).

	Always	Sometimes	Never	Don't Know	N.A.
MY DOCTOR	___	___	___	___	___
ADVERTISING	___	___	___	___	___
MEDICAL PROGRAMS ON T V	___	___	___	___	___
THE HEART FOUNDATION	___	___	___	___	___
NEWSPAPER ARTICLES	___	___	___	___	___
PUBLIC HEALTH NURSE	___	___	___	___	___

20. cont'd...	Always	Sometimes	Never	Don't Know	N.A.
MY FRIENDS	___	___	___	___	___
HEALTH COURSES TAUGHT IN SCHOOL	___	___	___	___	___
ADVICE FROM MY PARENTS	___	___	___	___	___
PEOPLE AT WORK	___	___	___	___	___
HEALTH BOOKS	___	___	___	___	___

21. Which of the following best describes your experience with tobacco? (Check all that apply).

I HAVE NEVER SMOKED	___	GO TO QUESTION 27
I USED TO SMOKE OCCASIONALLY	___	GO TO QUESTION 22
I USED TO SMOKE DAILY	___	GO TO QUESTION 22
I NOW SMOKE OCCASIONALLY	___	GO TO QUESTION 23
I NOW SMOKE DAILY	___	GO TO QUESTION 23

22. If you have stopped smoking, please indicate which applied to you: (Check all that apply to you).

I STOPPED SMOKING CIGARETTES OVER A YEAR AGO	___	GO TO QUESTION 27
I STOPPED SMOKING CIGARETTES RECENTLY	___	GO TO QUESTION 27
I STOPPED SMOKING A PIPE OR CIGARS OVER A YEAR AGO	___	GO TO QUESTION 27
I STOPPED SMOKING A PIPE OR CIGARS RECENTLY	___	GO TO QUESTION 27

IF YOU NOW SMOKE OCCASIONALLY OR DAILY, PLEASE INDICATE WHICH APPLIES TO YOU: (CHECK ALL THAT APPLY).

23. I now smoke

CIGARETTES	___
A PIPE	___
CIGARS	___

24. If you now smoke cigarettes, how many do you smoke each day? (Check one response).

5 OR LESS	___
6 - 10	___
11 - 15	___
16 - 20	___
21 - 25	___
26 OR MORE	___

25. Has your smoking changed over the last 12 months? (Check all that apply to you).

SMOKING MORE NOW	___
SMOKING LESS NOW	___
SWITCHED TO A STRONGER BRAND	___
SWITCHED TO A MILDER BRAND	___
NO CHANGE	___

26. Have you tried to stop smoking during the past 12 months?

YES	___
NO	___

27. During the past 12 months, did you try to change your food habits in any way?

YES	___
NO	___

IF YES, please explain the change and the reasons for it.

_____

_____

_____

_____

28. During the past 2 weeks how many times did you do each of the following activities? (Write the number of times in the space to the right of each activity).

CYCLING ____
JOGGING OR RUNNING ____
CALISTHENICS ____
BOWLING ____
BASEBALL OR SOFTBALL ____
BASKETBALL ____
RACQUET SPORTS ____
SWIMMING ____
AEROBIC DANCING ____
OTHER (PLEASE SPECIFY) ____

_____

_____

29. During the past 12 months how many times did you do each of the following activities? (Write the number of times in the space to the right of each activity).

CYCLING ____
JOGGING OR RUNNING ____
CALISTHENICS ____
BOWLING ____
BASEBALL OR SOFTBALL ____
BASKETBALL ____
SKIING ____
RACQUET SPORTS ____
SWIMMING ____
AEROBIC DANCING ____
OTHER (PLEASE SPECIFY) ____

_____

30. Which of the following choices best describes the work of the activity in which you usually do? (Check one response)

I AM USUALLY SITTING DURING THE DAY AND DO NOT WALK ABOUT VERY MUCH	___
I STAND OR WALK ABOUT QUITE A LOT DURING THE DAY, BUT I DO NOT HAVE TO CARRY OR LIFT THINGS VERY MUCH	___
I USUALLY LIFT OR CARRY LIGHT LOADS, OR I HAVE TO CLIMB STAIRS OFTEN	___
I DO HEAVY WORK OR CARRY VERY HEAVY LOADS	___

31. Please indicate how each of the following statements applies to you.

	Yes	No	Don't Know
I EXPECT TO BE THE IDEAL WEIGHT FOR MY AGE 5 YEARS FROM NOW	___	___	___
IN 5 YEARS, I EXPECT TO BE MORE PHYSICALLY FIT THAN I AM TODAY	___	___	___
IN 5 YEARS, I EXPECT MY GENERAL HEALTH WILL BE BETTER THAN IT IS TODAY	___	___	___
I PLAN TO CHANGE MY LIFESTYLE IN THE NEXT 5 YEARS TO IMPROVE MY HEALTH	___	___	___

32. The Heart Foundation has existed in Manitoba for several years. In your opinion, what role should the Heart Foundation play? (Please rank the following statements from 1 to 5. Place a 1 beside the most important, a 2 beside the second most important, a 3 beside the third most important, and so on).

	(Rank 1 to 5)
FUND HEART RESEARCH ACROSS CANADA	___
ASSIST IN PROVIDING DIAGNOSTIC AND TREATMENT FACILITIES FOR HEART PATIENTS	___
PUBLICIZE RISK FACTORS AND PREVENTIVE MEASURES TO THE COMMUNITY	___
FUND HEART RESEARCH IN MANITOBA	___
TRAIN PROMISING YOUNG RESEARCHERS AND HEART SPECIALISTS	___

33. Please indicate how much you agree or disagree with each of the following statements about health care. (Circle one response for each statement.)

	Strongly Agree	Agree	Un-Certain	Disagree	Strongly Disagree
OUR HEALTH PROBLEMS CAN BE SOLVED IF THE GOVERNMENT WOULD PROVIDE MORE MONEY FOR HEALTH CARE	1	2	3	4	5
AS AN INDIVIDUAL, THERE IS LITTLE I CAN DO TO INFLUENCE HEALTH CARE IN MY COMMUNITY	1	2	3	4	5
I THINK A DONATION TO THE HEART FUND IS AN EFFECTIVE MEANS TO HELP IMPROVE OUR HEALTH	1	2	3	4	5
WE RELY TOO MUCH ON THE GOVERNMENT TO PROVIDE FOR OUR HEALTH	1	2	3	4	5
GOOD HEALTH IS BASICALLY AN INDIVIDUAL RESPONSIBILITY	1	2	3	4	5
PRIVATE ORGANIZATIONS, LIKE THE HEART FOUNDATION, CAN AT BEST HAVE ONLY A MINOR INFLUENCE ON IMPROVING HEALTH	1	2	3	4	5

THE FOLLOWING QUESTIONS ASK ABOUT YOUR CONTACTS WITH HEALTH PROFESSIONALS AND YOUR FAMILY'S GENERAL HEALTH

34. Do you have a regular family doctor you would go to if you were sick?

YES ___

NO ___

35. When was the last time you saw a doctor for a general physical check-up?

WITHIN THE PAST YEAR	____
OVER 1 BUT LESS THAN 2 YEARS	____
OVER 2 BUT LESS THAN 3 YEARS	____
OVER 3 BUT LESS THAN 4 YEARS	____
OVER 4 BUT LESS THAN 5 YEARS	____
MORE THAN 5 YEARS AGO	____

36. During the past 2 weeks did you see or talk to any of the following health professionals about your health? (Check the appropriate response for each health professional).

	Yes	No
MEDICAL DOCTOR	____	____
DENTIST	____	____
NURSE	____	____
PHARMACIST OR DRUGGIST (FOR ADVICE, NOT PRESCRIPTIONS)	____	____
OPTOMETRIST OR OPTICIAN	____	____
CHIROPRACTOR	____	____
PSYCHOLOGIST, SOCIAL WORKER OR OTHER COUNSELLOR	____	____
ANY OTHER HEALTH PROFESSIONAL (PLEASE SPECIFY)		
_____	____	____

37. During the past 12 months, how many times did you see or talk to the following health professionals about your health? (Write the number of times in the space to the right of each health professional).

MEDICAL DOCTOR	____
DENTIST	____
NURSE	____
PHARMACIST OR DRUGGIST (FOR ADVICE, NOT PRESCRIPTIONS)	____
OPTOMETRIST OR OPTICIAN	____
CHIROPRACTOR	____
PSYCHOLOGIST, SOCIAL WORKER OR OTHER COUNSELLOR	____
ANY OTHER HEALTH PROFESSIONAL (PLEASE SPECIFY)	
_____	____

38. In general, how would you describe your present state of health? (Please circle the appropriate response from 1 to 5).

Very Good				Very Poor
1	2	3	4	5

39. In the past 12 months, how physically healtny have you felt? (Please circle the appropriate response from 1 to 5).

Very Unhealthy				Very Healthy
1	2	3	4	5

40. Have you ever had any of the following disorders? (Check the appropriate response for each disorder).

	Yes	No	Don't Know
HEART TROUBLE	___	___	___
HIGH BLOOD PRESSURE	___	___	___
STROKE	___	___	___
DIABETES	___	___	___
CANCER	___	___	___

41. Did your father ever have any of the following disorders? (Check the appropriate response for each disorder).

	Yes	No	Don't Know
HEART TROUBLE	___	___	___
HIGH BLOOD PRESSURE	___	___	___
STROKE	___	___	___
DIABETES	___	___	___
CANCER	___	___	___

4. Did your mother ever have any of the following disorders? (Check the appropriate response for each disorder)

	Yes	No	Don't Know
HEART TROUBLE	___	___	___
HIGH BLOOD PRESSURE	___	___	___
STROKE	___	___	___
DIABETES	___	___	___
CANCER	___	___	___

43. Did any other member of your immediate family or close friend ever have any of the following disorders? (Check the appropriate response for each disorder)

	Yes	No	Don't Know
HEART TROUBLE	___	___	___
HIGH BLOOD PRESSURE	___	___	___
STROKE	___	___	___
DIABETES	___	___	___
CANCER	___	___	___

IN THIS SECTION WE WOULD LIKE TO GET SOME IMPORTANT INFORMATION ABOUT YOU AND YOUR FAMILY. PLEASE CHECK THE CORRECT RESPONSE CATEGORY OR WRITE THE REQUIRED INFORMATION IN THE SPACE PROVIDED.

44. Date of Birth: _____
(Day) (Month) (Year)

45. Sex: FEMALE _____
MALE _____

46. What is your height? FEET _____
INCHES _____

47. What is your weight? POUNDS

48. What is your present marital status? (Check all responses that currently apply to you)

MARRIED	___
COMMON-LAW	___
WIDOWED	___
DIVORCED	___
SEPARATED	___
SINGLE (NEVER MARRIED)	___

49. Including yourself, how many people in each category live in your dwelling?

ADULTS (18 years and older)	___
CHILDREN (Under 18 years of age)	___

50. What was the highest level of education that you completed? (Check one response).

1 - 6 YEARS	___
7 - 9 YEARS	___
10 - 12 YEARS	___
TECHNICAL/VOCATIONAL TRAINING	___
SOME UNIVERSITY TRAINING	___
UNDERGRADUATE DEGREE	___
POST-GRADUATE DEGREE(S)	___

51. What is your current employment status? (Check the appropriate response category).

EMPLOYED FULL-TIME	___
EMPLOYED PART-TIME	___
KEEPING HOUSE	___
UNEMPLOYED	___
RETIRED	___
STUDENT	___
OTHER (PLEASE SPECIFY)	___

_____

52. What kind of work (do/did) you normally do? That is, what is your job title?

OCCUPATION _____

53. What is your family's total annual income? (Check the appropriate response category).

UNDER $9,000	____
$10,000 - $14,999	____
$15,000 - $19,999	____
$20,000 - $24,999	____
$25,000 - $29,999	____
$30,000 - $34,999	____
$35,000 - $39,999	____
$40,000 - $44,999	____
$45,000 - $49,999	____
$50,000 - $54,999	____
$55,000 - $59,999	____
OVER $60,000	____
DON'T KNOW	____

54. Were you born in Canada? Yes ____
No ____

IF YES, GO TO QUESTION 57.
IF NO, CONTINUE WITH NEXT QUESTION

55. In what country were you born? (Please be specific).

_____

56. In what year did you move to Canada? _____
(Year)

57. Do you consider yourself to be a member of a particular ethnic group? (Check the appropriate response).

YES	___
NO	___
DON'T KNOW	___

IF NO OR DON'T KNOW, SKIP TO QUESTION 59.
IF YES, CONTINUE WITH QUESTION 58.

58. To what ethnic group do you belong? (Write the name of your ethnic group on the following line).

_____

59. What is your religious preference. (Check the space by the appropriate response).

NO PREFERENCE	___
ANGLICAN	___
BAPTIST	___
GREEK ORTHODOX	___
JEHOVAH'S WITNESS	___
JEWISH	___
LUTHERAN	___
MENNONITE	___
PENTECOSTAL	___
PRESBYTERIAN	___
ROMAN CATHOLIC	___
UNITED CHURCH	___
OTHER (PLEASE SPECIFY)	___

_____

60. How strong is your religious preference (or lack of religious preference)? (Circle the appropriate response from 1 to 5).

Very Strong				Very Weak
1	2	3	4	5

Appendix B

QUESTIONNAIRE

IS THERE ANYTHING ELSE YOU WOULD LIKE TO TELL US ABOUT CARDIOVASCULAR HEALTH OR ANY OF THE QUESTIONS IN THIS SURVEY? IF SO, PLEASE USE THIS SPACE FOR THAT PURPOSE.

THANK YOU FOR COMPLETING THIS SURVEY. IN THE SPRING YOU WILL BE SENT A REPORT WHICH SUMMARIZES THE MAIN RESULTS. THE SAME REPORT WILL BE SENT TO THE HEART FOUNDATION.

Appendix C

FIRST COVER LETTER

IE UNIVERSITY OF MANITOBA

THE INSTITUTE FOR SOCIAL AND ECONOMIC RESEARCH
Faculty of Arts

Winnipeg, Manitoba
Canada R3T 2N2

September, 1983

(204) 269-5528

Dear

The Institute for Social and Economic Research is conducting a survey of the views of Manitoba residents about cardiovascular health.

Your name and address were selected randomly for this survey. A total of 1,800 Manitobans have been asked to participate. Since we are asking only a small group of people to complete this questionnaire, your participation is very important.

Please complete the enclosed questionnaire and return it in the postage paid, addressed envelope provided. Your name does not appear on the questionnaire and no one will be able to identify you or what you said in the results of this survey. The questionnaire has an identification number to let us know who has returned their booklet and who has not. The information you provide is strictly confidential. Once the computer file on the information has been completed, all reference to your name and address and this questionnaire will be destroyed. Your name, address or any information you supply will not be provided to any individual, private companies or government agencies.

Early next spring you will receive a report which summarizes the information gathered in this survey. By completing the questionnaire, you have a chance to share your views with those who are currently involved in providing cardiovascular health care and designing long-term health education programs.

If you have any questions about this survey or the questionnaire, please call 269-5528 during normal business hours.

Your cooperation is greatly appreciated.

Sincerely yours,

Appendix D

REMINDER POSTCARD

September 1983

Last week a questionnaire seeking your views about cardiovascular health was mailed to you. Your name was drawn in a random sample of Manitoba residents.

If you have already completed and returned it to us please accept our sincere thanks. If not, please do so today. Since the questionnaire was sent to only a small group of people, it is extremely important that your reply is included in the study if the results are to be meaningful.

If by chance you did not receive the survey, or it was misplaced, please call me right away at 269-5528 and another one will be mailed to you today.

Mark Badger
Field Co-ordinator

Appendix E

SECOND COVER LETTER

HE UNIVERSITY OF MANITOBA

THE INSTITUTE FOR SOCIAL AND ECONOMIC RESEARCH
Faculty of Arts

Winnipeg, Manitoba
Canada R3T 2N2
(204) 269-5528

October, 1983

Dear

Some time ago you received a questionnaire in the mail concerning cardiovascular health from the Institute for Social and Economic Research. As we have not yet heard from you, this letter is being sent (along with another copy of the questionnaire) to request your assistance once again in this survey. We would greatly appreciate it if you would complete the enclosed questionnaire and return it to us at your earliest convenience.

The information you provide is very important to the success of the survey and will be treated with the strictest confidence. Your answers will be combined with those received from the other 1,800 Manitoba residents taking part in the study and no one will be able to identify you or what you said from the results of the survey.

Your participation, of course, is completely voluntary but we hope you will find the time to answer these questions. If you are willing to answer the questions at this time, please return the completed questionnaire using the postage paid, addressed envelope.

Thank you for your assistance.

Sincerely yours,

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