

BREAST SELF-EXAMINATION: A TEST OF DECI'S
THEORY OF SELF-DETERMINATION

A DISSERTATION
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING

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DECEMBER 1989

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DEDICATION

This dissertation is dedicated to my husband, Rod, for his patience, kindness, faith in our ability to succeed, and most of all for his love and support.

ACKNOWLEDGMENTS

My deepest appreciation is extended to Dr. Rose Nieswiadomy who served as my committee chair. I will forever be indebted to her for shepherding me through this dissertation process. I am grateful for her constructive guidance and wise counsel.

To Dr. Helen Bush, Dr. Maisie Kaska, Dr. Marion Anema, Dr. Judy Baker, and Dr. Katherine Allen, I express my appreciation. Each contribution was significant to the completion of this study.

This study was partially funded by the Nursing Oncology Education Project. I am grateful for this financial support.

A special measure of gratitude is offered to all my friends and family who knew I could persevere. Finally, I acknowledge my Lord and Savior, from whom comes all good things.

BREAST SELF-EXAMINATION: A TEST OF DECI'S
THEORY OF SELF-DETERMINATION

ABSTRACT

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DECEMBER 1989

The purpose of this study was to evaluate the effectiveness of the Interaction Model of Client Health Behavior in selecting variables to predict a health behavior and to test relational statements from the theory of self-determination. These relational statements were: (a) perceived competence in an activity will increase the likelihood of deciding to perform the activity, and (b) a behavior that has no external reward will more likely be exhibited by a person who is intrinsically motivated. The final purpose was testing of the instruments. A random sample of addresses of women living in a southwestern city was obtained from a mail marketing firm. Survey instruments were mailed to 1,250, and 249 useable questionnaires were returned. A researcher-developed demographic sheet and six preexisting instruments were used: the Champion Knowledge Scale, the Lashley BSE Techniques Questionnaire, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and Cox's Health

Self-Determinism Index. Discriminant analysis was utilized to predict BSE performance from age, socioeconomic status, affective response to BSE, cognitive appraisal, social support, and intrinsic motivation. The variables of competence in BSE, affective response to BSE, and age explained 68% of the variance. Stepwise multiple regression was performed to examine the relationship of competence in BSE to the same independent variables. Affective response and cognitive appraisal predicted BSE competence. These variables accounted for 25% of the variance. A significant relationship was found between frequency of BSE and competence in BSE, $r_s = .51$, $p < .0001$. The relationship of frequency of BSE to intrinsic motivation was not statistically significant. Internal consistency was confirmed for all of the instruments except the HSDI. Factor analysis on the ISSB and the HSDI revealed item loadings different than previous studies. The Lauver BSE Scales demonstrated factor loadings consistent with previous research. Cox's model provided the structure for selecting the variables for the study of health behaviors. Deci's theory of self-determination was supported by the results of the testing of three of four hypotheses. The instrument measuring intrinsic motivation demonstrated reliability problems.

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CHAPTER I

INTRODUCTION

Cancer is the second leading cause of death in the United States, and breast cancer is the leading cause of all deaths among women 40 through 44 years old (American Cancer Society, 1988). Approximately 1 out of 10 women will develop breast cancer during their lives. An estimated 42,300 deaths will occur from breast cancer in 1988, and 135,000 new cases will be reported (American Cancer Society, 1988).

The American Cancer Society recommends the monthly practice of breast self-examination (BSE) by women 20 years and older as a routine positive health habit. About 80% of the physicians surveyed in a 1980 national study reported that monthly BSE is an effective method for detecting breast lesions. Studies also indicate that BSE is a life-saving practice (American Cancer Society, 1982).

A Gallup study (1987) reported that 74% of women performed BSE within the last year, which is up from 68% in the 1983 survey. However, this Gallup survey also showed that the monthly practice of BSE has decreased from 27% in 1983 to 23% in 1987. These studies also indicate that the

majority of American women do not practice BSE at the recommended monthly frequency.

The American Cancer Society (1988), as a goal, hopes to increase the number of women who receive breast cancer detection tests and who practice monthly breast self-examination. To help reach this objective, the Society has begun a new educational emphasis on breast cancer detection awareness.

The promotion of positive health practices requires sophisticated methods of identifying the factors which help or hinder these behaviors. Once these characteristics are described, nurses and other health care providers will be able to target specific interventions that will encourage positive health practices.

The Interaction Model of Client Health Behavior (IMCHB) developed by Cox (1982) emphasizes the process by which the singular position of each client on many variables influences health care behaviors. This model identifies and suggests exploratory relationships between client singularity, client-provider relationship, and subsequent client health behaviors. Intrinsic motivation is a primary element within this model (Cox, 1982).

According to Deci (1980), the intrinsic motivational subsystem is based on the need for self-determination and competence. It involves behavioral decision-making,

managing motives effectively, an internal perceived locus of causality, feelings of self-determination, and a high degree of perceived competence (Deci, 1980). This study utilized the IMCHB and the theory of self-determination to select variables that influence a specific health behavior, breast self-examination.

Problem of the Study

The problems of the study were to:

1. Determine the effectiveness of the Interaction Model of Client Health Behavior in selecting the predictors of the health behavior of breast self-examination.
2. Determine the relationship between competence in performing BSE and the practice of BSE.
3. Determine the relationship between intrinsic motivation and the health behavior of BSE.
4. Further test the instruments used to measure the variables suggested by the Interaction Model of Client Health Behavior.

Purpose of the Study

One purpose of this study was to evaluate the effectiveness of the Interaction Model of Client Health Behavior in selecting variables to predict a health behavior. Another purpose was to test relational statements derived from the theory of intrinsic motivation.

These relational statements were: (a) Perceived competence in an activity will increase the likelihood of deciding to perform the activity, and (b) a behavior that has no external reward will more likely be exhibited by a person who is intrinsically motivated. The final purpose concerned further testing of the instruments used in the study.

Rationale for the Study

According to the Surgeon General (Public Health Service, 1979), three reasons exist for a strong emphasis on prevention of disease. These reasons are to save lives, improve the quality of life, and reduce health care costs. Controlling risks is the basis of disease prevention and health promotion.

The Surgeon General's Report (Public Health Service, 1979) asserts that expectations for programs in disease prevention and health promotion must be geared to realities. Social factors, personal attitudes, economics, and the knowledge base are potential barriers to reaching the goals. Surveys undertaken for this government report indicate some people have a greater interest in healthy lifestyles, while many others remain apathetic and unmotivated. Some see illness as random chance and something to be tolerated. Some consider health promotion

activities as moralistic rather than scientific, and others may be wary of infringement upon personal liberties. However, as the scientific basis for suggested health promotion activities increases, these personal biases will begin to shift (Public Health Service, 1979).

Health professionals have an opportunity, as well as an obligation, to provide information and services necessary to promote better health and prevent disease. People continue to note that they would probably make changes in behaviors if their physicians strongly recommended these changes. "Professionals should be trained to view themselves as educators and models, as well as practitioners of a particular discipline" (Public Health Service, 1979).

Health promotion and disease prevention have long been of interest to nursing. In the current literature, three general themes express the core and scope of nursing: (a) concern with principles and laws that govern the life processes, well-being, and optimum functioning of human beings, whether sick or well; (b) concern with the patterning of human behavior in interaction with the environment in critical life situations; and (c) concern with the processes by which positive changes in health status are affected (Donaldson & Crowley, 1978).

According to Kulbok (1985), the number of research studies concerned with preventive health behaviors has increased during the last 4 decades. The majority of studies have attempted to determine why people use or do not use preventive health services. Several models have been proposed to explain health behaviors. Each model involves many variables that explain only a small percentage of the variance, when tested. Also, serious limitations in the reported research designs may account for the weak association between antecedent factors and preventive health behavior (Kulbok, 1985).

The literature abounds with studies trying to identify the predictors of the health practice of BSE (Lauver, 1987). Most of these studies use the Health Belief Model (HBM) to explain this practice; however, the results are inconclusive and disappointing. Lauver (1987) contended that the relevance of many of the constructs of the HBM to BSE has not been supported empirically and that an alternative theoretical perspective should be sought.

Cox (1982) proposed the Interaction Model of Client Health Behavior (IMCHB). This model recognizes the client's individuality and uniqueness in the attainment of positive health behaviors and guides the development of nursing interventions that would be specific to the client and the identified health need. While the IMCHB includes

many of the variables found in earlier models of health behavior, it also includes broad conceptual variables which can be operationalized to address and study specific health care problems (Cox, 1984).

The practice of breast self-examination (BSE) is an example of a health promoting activity that can be explored using the Interaction Model of Client Health Behavior. One-third of the women surveyed who do not do breast self-examination stated in the Gallup survey that they let the physician do the examination (Gallup, 1984). Considering that 75% of the women stated that a physician had taught them to practice breast self-examination, the question remains, why do only 27% follow the physician's advice? Because the literature offers no clear answer, the present study explored the factors influencing the practice of breast self-examination. Appropriate nursing interventions can be delineated based on the underlying factors related to practice or nonpractice.

The present study assessed the influence of multiple factors on the practice of breast self-examination. Variables suggested by the Interaction Model of Client Health Behavior were utilized in order to further examine this model. The study also explored relevant concepts delineated in Deci's theory of self-determination.

Theoretical Framework

This study utilized the Interaction Model of Client Health Behavior (IMCHB) and Deci's Theory of Self-Determination as the basis for explaining the health behavior of BSE. Deci's (1980) theory defines will as the capacity of the human organism to choose how to satisfy needs. Self-determination is the process of using one's will. Deci stated that the will is involved with the intrinsic need for competence and self-determination. People need to be self-determining and competent, which requires that they make choices. Thus, intrinsic motivation energizes the will to enhance or fight the force of drives, to resolve conflict among needs, and to delay the meeting of needs.

Intrinsic motivation is innate to the human organism and continues to develop during the socialization periods of childhood (Deci, 1980). Two processes occur through which external factors affect intrinsic motivation. The first is change in locus of causality. People perceive the locus of causality to be internal when they are intrinsically motivated. When extrinsic factors are present and a behavior is necessary to receive an external reward or to satisfy a constraint, they perceive the locus to be external. Thus, people feel self-determining when they perceive the locus of causality to be internal and

non-self-determining if they perceive the locus of causality to be external.

The second process that affects intrinsic motivation involves a person's perception of competence regarding the activity of concern (Deci, 1980). If a person perceives the self as more competent as a result of some activity, then the intrinsic motivation for that activity will be increased. However, forced competence does not enhance intrinsic motivation. Self-determination (deciding for oneself) is more fundamental than competence (doing something well) in respect to intrinsic motivation.

The interaction of environmental factors and personality factors calls forth a particular motivational subsystem (Deci, 1980). Behaviors, cognitions, feelings, and beliefs consistent with the subsystem result. There are three motivational subsystems: intrinsic, extrinsic and amotivational.

The intrinsic motivational subsystem is based on the need for competence and self-determination. It involves decision-making, managing motives effectively, an internal perceived locus of causality, feelings of self-determination, and a high degree of perceived competence or self-esteem.

The extrinsic motivational subsystem involves greater responsiveness to external than internal cues and involves behavior for which the rewards are separable from the behaviors and the accompanying feelings (Deci, 1980). In contrast, the rewards for the intrinsic subsystem are the feelings that accompany self-determined, competent behavior. The perceived locus of causality is external in the extrinsic subsystem. Behaviors are controlled by reward contingencies instead of choice, with resulting lower self-esteem.

The amotivational subsystem is characterized by lack of activity (Deci, 1980). The person perceives no relationship between behaviors and outcomes. As a result, perceived competence, self-determination and self-esteem are low, and the person feels helpless and out of control.

These three motivational subsystems are congruent with three different beliefs about causality (Deci, 1980). The intrinsic subsystem involves a belief in the dependence of outcomes on behavior, with causality seen as internal. The extrinsic motivational subsystem involves a belief in the dependence of behavior and outcomes, but the causality of behavior is seen as external. The amotivational subsystem involves a belief in the independence of behavior and outcomes that implies futility. People have a particular

orientation, depending upon which subsystem is predominant in their interactions with their environment.

According to Deci (1980), a stimulus, which can be sensations from the environment, internal sensations from the tissues, or bits of information accessed from memory, elicits a motive (Figure 1). When aware of potential satisfaction, the person selects behaviors (or sets goals) that are expected to result in that satisfaction. This goal setting is defined as behavioral decision-making. The next step concerns the selected purposive behavior. If the goal is reached, the behavior is ended. If the expectations were correct, satisfaction follows immediately from the goal completion. If not, a new goal may be selected.

Deci (1980) defined intrinsic motivation as the human need to be competent and self-determining. Intrinsic motivation provides the energy for the various functions of the will, such as deciding whether to choose behaviors to satisfy physiological drives or intrinsic and affective needs, to oppose the force of drives and control the forces of emotions, or to hold in abeyance motives that for one reason or another cannot be satisfied at that time. Underlying this theory are the assumptions that all behaviors are not based in physiological drives and that humans have the capacity to choose behaviors.

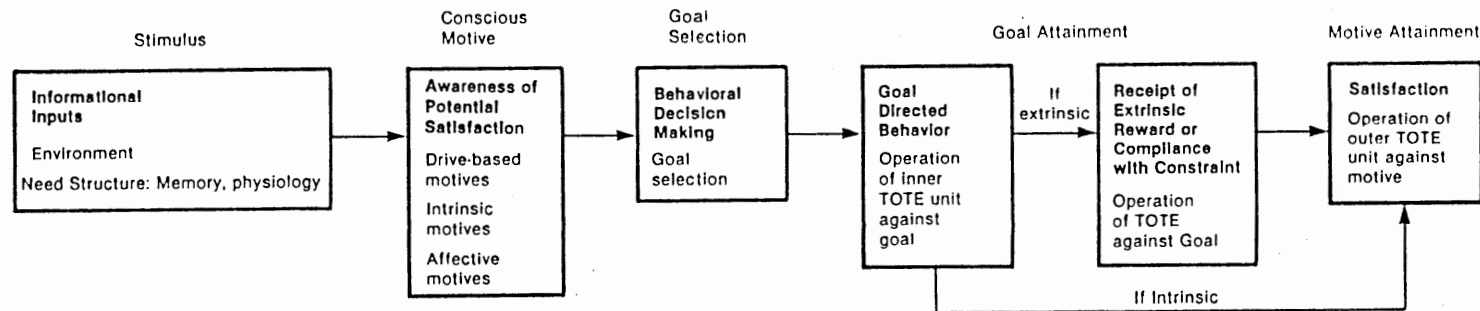


Figure 1. Basic structure of an organismic theory of self-determined behavior.

Note: From Psychology of Self-Determinism (p.55) by E. Deci, 1980, Lexington, MA: Lexington Books. Copyright 1980 by Lexington Books. Reproduced by permission.

Intrinsic motivation, which is an element in Cox's Interaction Model of Health Behavior, is significantly different from the motivational construct implied within most health behavior models. First, motivation in other models is subsumed under cognition, with no regard for the role of affect. Thus, interventions have been directed at changing these cognitions (health beliefs) without considering the complex relationships between cognitions, motivation, and affect (Cox, 1982).

A second difference is that other models do not explicitly recognize human needs and choice as factors in health behaviors. The client is viewed as a passive processor of information. These models do not accept the concept of competing needs or the ability of the client to choose between behaviors independently (Cox, 1982).

Other models do not address the antecedents of motivation. By specifying the antecedent conditions, the theoretical base for development of interventions is strengthened. This humanistic concept of intrinsic motivation will be a stronger concept of motivated health behavior than the cognitive theories expressed in other health behavior models, such as Rosenstock's Health Belief Model. The construct will not only provide more explanatory power, but it will also serve as a guide for

the development of health care provider interventions (Cox, 1982).

These interventions will recognize the importance of choice, personal control, and feelings of competency and self-determination as significant factors in health behavior. The IMCHB asserts that clients in most situations have the capacity to choose behavior. These choices are limited by specific internal (e.g., severity of illness, intelligence) and external (provider interventions, availability of services) environmental forces. The IMCHB also relates intrinsic motivation to antecedent conditions (client singularity). Socioeconomic variables, environmental resources, cognitive appraisal, and affective response would act simultaneously but interdependently on the degree of intrinsic motivation (Cox, 1982).

The IMCHB subsumes many of the variables generated by other health behavior models (Cox, 1982). However, this model emphasizes the process by which the singular (unique) position of each client on those variables is translated into health behavior. This model suggests that health behavior can be explained best through the simultaneous examination of these variables interactively and cumulatively. Also, this model posits that an understanding of the temporal nature and interaction of

these variables with one another and health behavior allows the determination of management approaches and specific nursing interventions (Cox, 1982).

The Interaction Model of Client Health Behavior (IMCHB) can be used as a tool to guide nursing research. The IMCHB can be operationalized and applied using as many of the major elements as indicated by the extent of research in the given area or the complexity of the particular study undertaken (Cox, 1986). The relevant variables are derived from the literature and clinical practice specific to the selected health issue.

The IMCHB may also be used to investigate the role of self-care practices in health and illness as well as to examine holistic approaches. The assumptions inherent in this model support the client's responsibility for his or her own health care. The model emphasizes the process by which the health care professional assists the client in the decision-making process. Recognition of the singularity of the individual and the adaptation to that uniqueness can give direction to nursing interactions, theory development, and research (Cox, 1982).

The model assumes that clients are capable of making informed, independent, and competent health care choices and those choices are affected by the client's singularity and the client-provider relationship. Another assumption

is that clients should be given the maximum amount of control, within the constraints of their internal and external environments, to determine the quality of their health and health preservation actions. The Interaction Model of Client Health Behavior is represented in Figure 2 (Cox, 1982).

In a study of the factors influencing the decisions to accept or reject an amniocentesis test, Cox and Roghmann (1984) used the Interaction Model of Client Health Behavior to direct the development of the study. Survey data as well as data from birth certificates, service logs, and census data from the Health Systems Areas were used. The data were originally used to look at whether prenatal reassurance might influence reproductive intentions (Roghmann & Doherty, 1983). A secondary data analysis was then performed utilizing the Interaction Model of Client Health Behavior. Through computer matching, multiple data files for each client were compiled for a single data collection year. The survey responses were matched to (a) the physicians' responses on a similar questionnaire, (b) birth certificate information, and (c) service logs indicating whether the client elected genetic counseling, amniocentesis, both, or neither of these services. A structural modeling technique was applied to the data to allow for the examination of both the direct and indirect

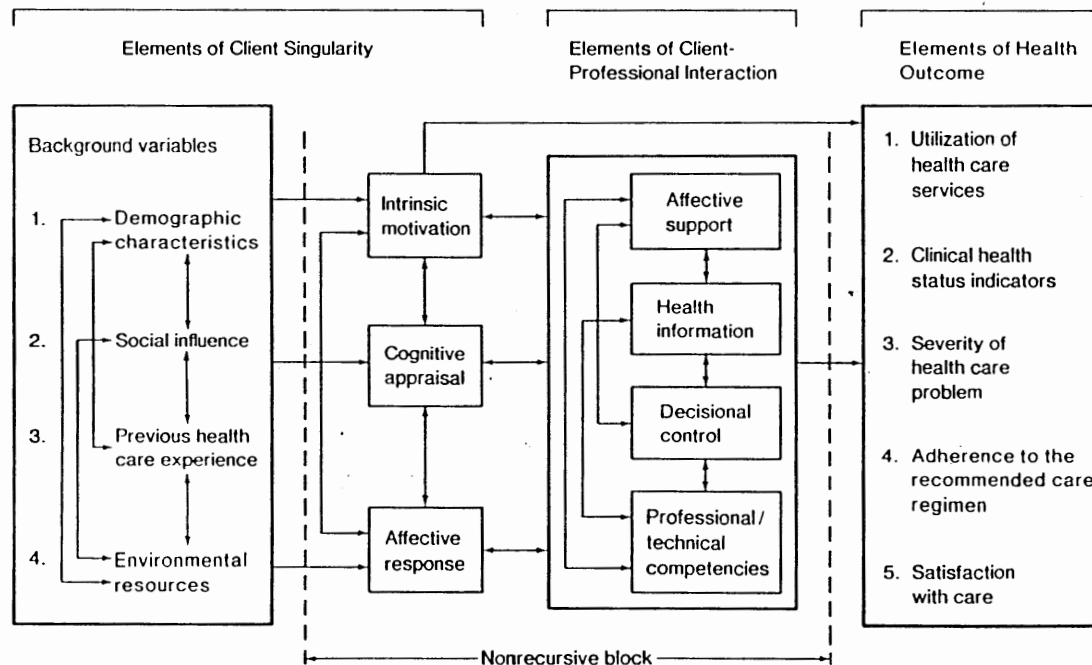


Figure 2. Interaction Model of Client Health Behavior.

Note: From "An Intervention Model of Client Health Behavior: Formulation and Test" by C. Cox, 1982, Doctoral dissertation, University of Chicago.

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effects of the independent variables on the dependent variables. The causal model that best fit the data was presented.

An explanation of less than optimal use of prenatal diagnostic services was demonstrated. Although exploratory in design, the study showed the IMCHB to be a useful indicator of the causal factors for the lack of use of available services (Cox & Roghmann, 1984).

The IMCHB was used in the present study to suggest the variables to be analyzed. Background variables were age, socioeconomic status, and social support. The other components of client singularity which were studied were intrinsic motivation, cognitive appraisal, and affective response. The element of health outcome chosen was breast self-examination, a recommended health care regimen. Breast self-examination is an autonomous health behavior; therefore, the element of the client-professional interaction was not examined.

Assumptions

For the purposes of this study, the following assumptions were made:

1. Breast self-examination is a useful procedure for detecting early breast cancer.

2. Individuals are capable of making choices among behaviors.

3. Individuals have an innate need to be competent and self-determining.

4. Subjects will self-report honestly.

5. Health behavior has a multicausal structure.

Hypotheses

The following hypotheses were tested:

1. There is a predictive relationship between (a) age, (b) socioeconomic status, (c) cognitive appraisal, (d) affective response, (e) social support, (f) intrinsic motivation, (g) competence in performing breast self-examination, and frequency of breast self-examination by adult women.

2. There is a predictive relationship between (a) age, (b) socioeconomic status, (c) cognitive appraisal, (d) affective response, (e) social support, (f) intrinsic motivation, and competence in performing breast self-examination by adult women.

3. The more competent adult women are in the performance of breast self-examination, the higher is the frequency of breast self-examination.

4. The more intrinsically motivated adult women are, the higher is the frequency of breast self-examination.

Research Questions

Additionally, the following research questions were addressed:

1. What are the test-retest reliability coefficients for the Champion Knowledge Scale, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, the Health Self-Determinism Index, and the Lashley Breast Techniques Questionnaire?
2. What are the internal consistency reliability coefficients for the Champion Knowledge Scale, the Lashley BSE Techniques Questionnaire, and the subscales of the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index?
3. What are the inter-item correlations and item-scale/subscale correlations for the Champion Knowledge, the Lashley BSE Techniques Questionnaire, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index?
4. What factors are contained within the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index?

Definition of Terms

The terms defined include the criterion variables of frequency of breast self-examination and competency of

breast self-examination as well as the predictor variables of age, socioeconomic status, cognitive appraisal (health knowledge), affective response (comfort and remembering), social support, and intrinsic motivation.

1. Adult women--females 18 years of age and older.

2. Breast self-examination (BSE)--examination of the breasts by the subject to determine the presence of lumps, dimpling, or discharge from the nipples. Breast self-examination has two components: competence and frequency. Frequency was measured in this study by six items on the Champion Knowledge Scale. The first question determines if the subject has ever practiced breast self-examination. The next items describe the frequency over the last 3 months and during the last year. Competence in breast self-examination was measured by the Lashley BSE Technique Questionnaire. This 14-item checklist is based on American Cancer Society and National Cancer Institute recommendations for BSE technique. It yields scores ranging from 0 to 14, with 14 indicating complete performance of all the recommended BSE steps (Lashley, 1987).

3. Age--the number of years of life as stated by the subject.

4. Socioeconomic status--the relative position of a person in a hierarchy which maximally reflects differences

in health behavior. This composite of characteristics reflects the expected level of preventive health behavior in the score of the person (Green, 1970). In this study, the socioeconomic status (SES) was measured by the Green SES Indices.

5. Cognitive appraisal--the mental process of placing an event in a series of evaluative categories related either to its significance for the person's well-being or to the available coping resources and options (Lazarus & Laumier, 1978). In this study, cognitive appraisal was measured by the Champion Knowledge Scale. The Champion Knowledge Scale is a 25-item instrument that measures the subject's knowledge of the procedure of BSE, risk factors for breast cancer, treatment, and outcome (Champion, 1988).

6. Affective response--the subject's emotional arousal in response to the perception of the issue (Cox, 1982). In this study, affective response was measured by the Lauver BSE Scales. This instrument measures the subject's feelings of remembering and comfort regarding BSE (Lauver & Angerame, 1988).

7. Social support--influence of the subject's social group (Cox, 1982). In this study, the variable was measured by the Inventory of Social Supportive Behaviors (ISSB). The ISSB is a self-report measure that assesses

how often an individual received various forms of assistance during the preceding month (Barrera, 1985).

8. Intrinsic motivation in health matters--the innate human need to be competent and self-determining in health matters (Cox, 1982). In this study, this construct was measured by the Health Self-Determinism Index (HSDI), a questionnaire composed of four subscales of self-determinism in health behavior, perceived competency in health matters, and internal/external cue responsiveness (Cox, 1987).

Limitations

The following were the limitations of the study:

1. Subjects may have responded in a socially desirable manner.
2. The instrument format (written questionnaire) may have increased measurement error.
3. The questionnaire may have evoked anxiety which, in turn, may have influenced the subjects' responses.
4. The use of mail methodology resulted in low response rates.
5. The instruments vary from the third to the sixth grade reading level. Reading level of the subjects was not controlled.

Delimitations

The following were the delimitations of this study:

1. Subjects were English-speaking adult women who could read and write.
2. Subjects were chosen from a mail marketing list.

Summary

This chapter reviewed the impact of breast cancer on American women and discussed the importance of breast self-examination in the early detection of breast cancer. The low rate of breast self-examination practice was presented and the question was raised regarding the underlying reasons for this low rate. Deci's Theory of Self-Determination was offered as a method of explaining the underlying factors influencing the practice of breast self-examination. The Interaction Model of Client Health Behavior suggested the variables for the present study concerning the correlation of frequency and competency of breast self-examination with age, socioeconomic status, cognitive appraisal, affective response, social support, and intrinsic motivation.

CHAPTER II

REVIEW OF THE LITERATURE

This review of the literature discusses the impact of breast cancer on the female in the United States and the importance of breast self-examination as a diagnostic tool. Previous studies that identified factors influencing the practice of BSE are reviewed. These factors include socioeconomic variables, such as age, marital status, and educational level; cognitive variables, such as health knowledge and competence; and, also, affective variables, such as fear and modesty. The Health Belief Model as an alternative theoretical framework is addressed separately, although some overlap with other sections does occur. Social support and intrinsic motivation are also discussed. Experimental studies in which an attempt was made to influence the practice of BSE are presented.

Breast Cancer

The mortality statistics do not fully describe the toll breast cancer takes on women. Delays in early detection and treatment can be disastrous. The National Cancer Institute (1984) stated that the 5-year survival rate for localized breast cancer is 85%, the best for any

localized cancer. However, when cancer spreads beyond the initial site, survival rates drop to 56%, resulting in the loss of 29% more lives and, undoubtedly, more suffering.

According to the National Cancer Institute (1984), about one-half of the cases of breast cancer in white women are diagnosed while localized. Another 41% are regionalized, and 9% have metastasized. In black women, the figures are 33%, 50%, and 17%, respectively. As a result, 5-year survival rates in black women are not as good as those for white women. For women under the age of 45 whose disease is localized, recent 5-year survival rates are comparable, regardless of race (National Cancer Institute, 1984).

On the whole, survival rates have improved from 63% for those women diagnosed in the early 1960s to 72% for those diagnosed in the mid-1970s (National Cancer Institute, 1984). Screening programs are expected to improve survival rates even more. A study by the Health Insurance Plan of New York in the 1960s found that more than 70% of the women with cancer had negative nodes (localized) as compared to 46% of the control group. The Breast Cancer Detection Demonstration Project found that fewer than 20% of the women whose cancers were detected through screening had positive nodes (Baker, 1982).

The status of lymph nodes is the most important factor in determining the prognosis of breast cancer. Women with negative nodes (free of cancer) have a much better chance of remaining free of cancer. The 10-year survival rate is 60% when axillary lymph nodes cannot be palpated, 50% when the nodes can be palpated but are freely movable, and 20% when the nodes are above the collarbone (National Cancer Institute, 1984).

Leis (1977) followed 1,859 patients with primary breast cancers, from 1950 to 1975. Patients with small lesions diagnosed by x-ray had a 10-year survival rate of 97.1%, as compared to a 70.2% survival rate in women with palpable lesions and negative nodes. The survival rate was 38.4% for those with positive nodes. Thus, the earlier the diagnosis, the higher is the long-term survival rate. Early diagnosis also allows less extensive surgery, with better cosmetic and functional results. Leis asserted that a careful physical examination of the breast should be a routine part of every complete examination. He also contended that physicians have an obligation to teach their patients the proper technique of breast self-examination. Leis suggested that women are not apt to practice breast self-examination unless taught the procedure by a physician, and then followed with frequent reinforcement.

A nationwide survey by the American Cancer Society (cited in Emery, 1985) found that only 20% of physicians perform breast examinations at the recommended intervals of every 3 years in women 20 to 40 and annually for women over 40. Yet only 1% of the physicians disagreed with the recommendation. Among internists, 7% do not perform breast examinations on apparently healthy women. Eight percent either do not advise women to practice BSE or only encourage BSE of women in the high risk group.

Another study reviewed the hospital records of 108 patients in high risk groups for breast cancer. None of the records documented the teaching of BSE by physicians or nurses even though only 10 records indicated that the patient practiced BSE. Only 28% of the patients in the university medical center and 30% of the patients in the private hospital had documentation of a breast examination by the health personnel (Sheahan, Lee, & Lewis, 1984).

Mammography can also detect some lesions before they are of palpable size (about 1 centimeter). Because of the radiation risk, mammography is only selectively recommended (Leis, 1977). A baseline mammogram is recommended between the ages of 35 to 40. For women in their 40s, mammograms are recommended every 1 to 2 years, and an annual mammogram is recommended for women over 50 (American Cancer Society, 1987). The American Cancer Society survey found that 89%

of the physicians do not comply with these recommendations. One-quarter of this group contended the guidelines would expose women to excessive radiation and almost half said they have never done mammograms unless signs of cancer were already present (Emery, 1985). The American Cancer Society's National Task Force on Breast Cancer Control (1982) stated that the appropriate use of mammography in conjunction with clinical examination and breast self-examination offers to women over 50, and perhaps to women 40 to 49, the promise of significantly increasing the cure rate of the leading cancer killer of American women.

Although breast self-examination is less sensitive in detecting small breast tumors than either palpation by a health professional or mammography, several advantages are offered. Breast self-examination can be performed at home, costs nothing, and is free of risk. More important, BSE can help discover breast cancers early when they are small and the chance for cure is better. Several clinical studies have confirmed the efficiency of BSE in discovering early cancers (Feldman, Carter, Nicastrì, & Hosat, 1981; Foster et al., 1978; Huguley & Brown, 1981). Based on clinical data, one other study estimated that 3.6 lives are saved for every 100 malignancies found by routine physician examination (Greenwald et al., 1978). Only 51% of the women in the study practiced self-examinations on a monthly

basis. The study concluded that the maximum possible benefit to be derived from self-examination may, therefore, be higher.

Factors Influencing Breast Self-Examination

Because of the impact of breast cancer and the readily available early detection procedure, the practice of breast self-examination has been studied frequently. Although some of the studies have been atheoretical, many of the studies utilized the Health Belief Model (Brailey, 1986; Calnan & Moss, 1984; Champion, 1985, 1987; Williams, 1986). Unfortunately, the results have been inconsistent. Valid conclusions are hampered by the various research methodologies and operational definitions used in the studies.

Major studies regarding BSE and breast cancer have been conducted by the Gallup Organization for the American Cancer Society (Gallup Organization, 1973, 1974, 1983, 1987). These large surveys were conducted nationwide, and the representative sample allows generalizability. However, these studies were not based on a theoretical framework.

In 1973, the women who were surveyed grossly overestimated the prevalence of breast cancer; yet in 1983 more than 56% underestimated their chances for developing

this disease. The 1973 survey revealed that 77% of the women had heard of BSE, but only 30% of those ever practiced it. Only 18% of the women practiced BSE monthly. Lack of knowledge of proper BSE techniques was evidenced by 53% of non-practicers who were aware of BSE. Of practicers, 22% were uninformed of correct positions. Almost half (46%) of the women indicated that monthly exams would make them worry unnecessarily. Other avoidance responses were reported by 46% of nonpracticers. Only 22% of women who had ever practiced BSE felt very confident that they knew how to perform BSE, and only 35% indicated that they would know what a lump felt like. Among practicers who were confident about the BSE procedures, 52% had practiced BSE monthly for the prior year. Conversely, only 16% of practicers who were not confident had practiced BSE monthly.

In the 1973 Gallup survey, the practice of BSE was found to be inversely related to age. Other studies have confirmed this finding (Celentano & Holtzman, 1983; Howe, 1981a). A study of women, aged 60 and older, by Baker (1988a) revealed that the younger women in the group practiced BSE more frequently. The 1983 Gallup survey found similar proportions of women in various age groups reported regular BSE practice. The 1973 Gallup survey found BSE practice was directly related to the size of the

community of residence. Practice was also directly related to level of education and income.

By 1983, 27% of the women practiced BSE monthly. Again the practice was directly related to education. Among women who had never examined their breasts, 33% gave the reason that they let their doctor do it, 17% felt no need for self-examination, and 16% believed they were not qualified. Another 9% reported lack of time, and 4% stated they were afraid of finding cancer (Gallup, 1984).

Health knowledge is a frequently included variable in studies about BSE. This variable is most often defined as the factual knowledge possessed by the subject in regard to the prevalence of breast cancer, risk factors, and BSE technique. One Champion (1985) study revealed no significant correlation between knowledge and BSE practice; yet, in another study (Champion, 1987), knowledge was the second most important predictor variable. Small, but significant, relationships were also found by other investigators (Reeder, Berkanovic, & Marcus, 1980; Williams, 1986).

Competence or the confidence a woman has in the ability to perform BSE or detect abnormalities has been addressed. More frequent practice of BSE has been positively related to competence in many studies (Bennett, Lawrence, Fleischmann, Gifford, & Slack, 1984; Brailey,

1986; Calnan & Moss, 1984; Carter, Feldman, Tiefer, & Hausdorff, 1985; Champion, 1988; Edwards, 1980; Nettles-Carlson, Field, Friedman, & Smith, 1988; Trotta, 1980). Only three reports showed no significant relationship between competence and BSE practice (Hirshfield-Bartek, 1982; Mamon & Zapka, 1985; Reeder et al., 1980). Champion (1989) found barriers and knowledge predicted competence, although not frequency of BSE.

The effect of emotions on the practice of BSE has been explored by a few researchers. Fear of discovering cancer or fear of cancer treatment has been suggested as a reason some women might not practice BSE. Several studies have addressed this variable with no significant relationships reported (Manfredi, Warnecke, Graham, & Rosenthal, 1977; Nettles-Carlson et al., 1988; Siero, Kok, & Pruyn, 1984). Meyerowitz and Chaiken (1987), in a small pilot study ($n = 21$), showed the strongest correlate of low BSE performance was the item, "fear of finding a lump" ($r = .64$, $p < .001$). In the 1983 Gallup study, 4% of the women who never practiced BSE gave as the reason "not wanting to know if they had cancer."

Although modesty has been postulated as a variable, its effect on BSE practice has seldom been evaluated. Howe (1981a) showed that modesty or inhibition was negatively and significantly related to the practice of BSE. Yet

another study found no relationship between embarrassment and BSE (Nettles-Carlson et al., 1988). A trial comparing affective and cognitive methods of motivating BSE practice concluded that emphasis on feelings, values, and attitudes regarding breast cancer in the educational process did not significantly contribute to motivating behavior (Carter et al., 1985).

Self-concept explained most of the variance in BSE practice in a study by Hallal (1982). The variable of health locus of control also added a small amount to the explained variance.

Health Belief Model

Many of the studies concerning the practice of breast self-examination have utilized the Health Belief Model as a theoretical framework. The term health-related behavior refers to a group of behaviors, including health behavior, illness behavior, sick role behavior, chronic illness behavior, and at-risk behavior (Mikhail, 1981). The Health Belief Model (HBM) was intended specifically to explain preventive health behavior (Rosenstock, 1974). However, the model has been expanded and applied to sick-role behavior as well (Becker, Drachman, & Kirscht, 1974). Preventive health behavior is defined as any activity undertaken by a healthy person, for the purpose of

preventing disease or detecting it in an asymptomatic stage (Kasl & Cobb, 1966). By this definition, BSE would fall in the category of preventive health behavior, and the HBM would be a likely choice for the theoretical framework for research involving BSE.

The HBM is based on the specific concept of Kurt Lewin's theory that is defined as goal setting in the level-of-aspiration situation (Rosenstock, 1966). The HBM asserts that the person only acts on the basis of what is perceived to be reality. The HBM model is composed of the individual's perception of susceptibility to a disease, the severity of the disease, and the benefits and costs associated with paths of action that can be taken to prevent disease. These perceptions are affected by various demographic, structural, and sociopsychological variables. A cue or triggering mechanism is also necessary for initiating the action (Becker et al., 1974).

The original components of the HBM only addressed negative aspects of health. Health motivation was introduced into the HBM on the assumption that motives selectively alter an individual's perception of the environment (Becker et al., 1974). The concept of health motivation was defined as an individual's degree of interest and concern about health matters. This definition suggests that positive health motivations exist and account

for some portion of health-related behavior. In Mikhail's (1981) review of the the HBM, she concluded that the HBM has value for research and practice.

A frequently quoted study was conducted by Stillman (1977). Of 122 women, 97% scored high on the perceived benefits of BSE, and 87% scored high in perceived risk; yet only 48% practiced BSE monthly. More than 20% had high belief in susceptibility and benefits, but did not practice BSE. There was no difference in the knowledge level of those women who practiced BSE and those who did not. No correlations or significance levels were reported.

Several studies found a weak but significant positive relationship between perceived susceptibility and BSE practice (Eith, 1983; Hallal, 1982; Hirshfield-Bartek, 1982; Trotta, 1980; Williams, 1986). However, others found no significant relationship (Calnan & Moss, 1984; Lashley, 1987).

The reports of the relationship between perceived benefits and BSE practice has also been mixed. Although Lashley (1987) and Hirshfield-Bartek (1982) found no significant relationship, several studies have demonstrated a positive relationship (Brailey, 1986; Calnan & Moss, 1984; Champion, 1985, 1987; Williams, 1986).

Perceived seriousness has seldom been chosen as a variable to study. When correlated with BSE practice, this

concept showed a weak but significant relationship (Champion, 1985, 1987, 1988), except in one study in which it was not significant (Williams, 1986). Champion developed the instruments used in all of these studies.

Perceived barriers, another HBM variable, was included in all the Champion (1985, 1987, 1988) studies as well as in the Williams (1986) study. The variable of perceived barriers was either the first or second most important predictor in all of these studies. Lashley (1987) and Trotta (1980) also found a significant relationship between barriers and BSE practice, although Hirshfield-Bartek (1982) was not able to demonstrate such a relationship. The HBM variable that was added to the model last, health motivation, proved to be one of the two most important predictors of BSE practice in two of the Champion (1985, 1988) studies and the Williams (1986) study.

Champion (1984) argued that methodological problems have plagued the research based on the HBM. She contended that tools were not tested for validity or reliability, operational definitions varied greatly from one study to the next, only one or two items were frequently used to measure a concept, and concepts were often measured at the nominal level. After developing and thoroughly testing tools to measure the HBM constructs in relation to BSE practice, Champion (1988) agreed with Lauver's (1987)

conclusions. She suggested that alternative theories should be considered as a theoretical framework because only 44% of the variance was accounted for even with the addition of demographic variables.

Social Support

Social support has been described as interpersonal interactions that produce a sense of belonging, are necessary throughout the lifespan, and communicate positive affect. The mutual exchange of social support is seen as augmenting feelings of personal efficacy and respect (Muhlenkamp & Sayles, 1986). In contrast to the previous definition, social support might be conceptualized as the diversity of natural helping behaviors that individuals actually receive when provided with assistance (Barrera, Sandler, & Ramsay, 1981). Researchers from various disciplines realized the need for adequate measures of social support, as the potential impact on stress, maintenance of health, and the restoration of well-being was recognized (Weinert, 1987).

Most of the BSE studies did not measure social support as defined by either Muhlenkamp and Sayles (1986) or Barrera et al. (1981). Marital status, supportive friends, and higher level socioeconomic status were often mentioned as variables, although the concepts were not always clearly

defined. A Gallup (1983) study reported that 29.1% of the women who performed BSE every month were married, while only 15.9% were married in the group who never performed BSE. Of the women in the income ranges of \$10,000 to \$20,000, 32% performed BSE monthly. While only 20% of the women in the less than \$10,000 range performed monthly examinations, 25% of the women in each of the ranges above \$20,000 practiced monthly exams.

Antonovsky, Sofer, and Larholt (1983/1984) found that relevant social and environmental influences included pressure, interest, and encouragement by family members, friends, and health care providers. This study revealed that women whose husbands showed interest and encouraged them to perform BSE were more likely to perform BSE, although the relationship was not statistically significant ($p = .08$). Howe (1981a) also found that in a group of high risk women, social influence was significantly associated with BSE frequency (Cramer's $\chi^2 = .300$, $p = .001$)

An interesting study, using an interactive computer program, obtained data from 616 women (Bennett, Lawrence, Fleischmann, Gifford, & Slack, 1983). The percentage of women who practiced BSE monthly was essentially the same, considering all demographic variables. However, living with one's sexual partner was associated with more frequent practice of BSE for unmarried women ($\chi^2 = 22.06$, $p < .001$).

When married women were included in the analysis with unmarried women who lived with their sexual partner, this group practiced more frequent BSE than other unmarried women ($\chi^2 = 12.3$, $p < .01$). Being married was not, of itself, associated with more frequent BSE.

Calnan and Moss (1984) differentiated social pressure and social support. Social pressure was defined as encouragement from friends, relatives, or neighbors. Social support, however, was defined as a confiding relationship with a close friend. Discriminant analysis confirmed social support as one of four criteria for predicting satisfactory BSE practice after attending a class on BSE.

In a study evaluating BSE frequency and competency, Celentano and Holtzman (1983) found that marital status was not a significant predictor of performance, but a higher income level was ($p = .005$). However, neither were predictors of competence in performance. High competence was associated with young age.

Social support has been studied in relation to other health-related behaviors. Derenowski (1988) found that social support was correlated with wellness motivation in the postmyocardial infarction patient ($r = .43$, $p = .05$). Perceived beliefs of others about the prescribed regimen was predictive of adherence to the medical regimen in

another group of postmyocardial infarction patients (Miller, Wikoff, McMahon, Garrett, & Ringel, 1988).

Utilizing path analysis, Muhlenkamp and Sayles (1986) studied the relationships between self-esteem, social support, and positive health practices. The major finding in the path analysis was that social support may have no direct effect on lifestyle, exerting all of its influence through self-esteem ($r = .54$, $p = .0001$).

Intrinsic Motivation

Intrinsic motivation is defined in terms of an individual's underlying need for a sense of competence and self-determination (Deci, 1980). Intrinsically motivated behaviors are those that are performed in the absence of any apparent external contingency. Competence and self-determination are inextricably related and generally covary in real-life situations. Competence must occur within the context of self-determination to be intrinsically rewarding. Deci (1980) also contended that perceiving oneself as competent at an activity will increase one's intrinsic motivation for the activity; perceiving oneself as incompetent will decrease one's intrinsic motivation for the activity.

Although none of the BSE studies utilized the concept of intrinsic motivation, competence and health motivation

were often positively related to BSE practice or were important in the explanation of variance. Cox (1982) has developed a model built around the theory of intrinsic motivation and self-determination that can be helpful in explaining client health behaviors. The Cox model takes into account the psychological and sociological influences but emphasizes the process by which the position of each client on those variables is translated into health behaviors. Cox (1984) has used the model to explain or predict health behaviors. One study was undertaken to examine motivation for health behavior, perceptions of health status and loneliness, and the sense of psychological well-being in a group of elders (Cox, 1986). Variables suggested by the model explained 54% of the variance in the general well-being of these subjects and 47% of the variance in perception of health status.

Experimental Studies on Breast Self-Examination

Many of the BSE experimental studies have involved interventions designed to increase BSE frequency and/or competence. Most of these interventions were educational in nature. Although many studies recorded increased BSE performance, the majority of the results of experimental programs were mixed.

Utilizing the theory of innovation adaptation to develop media messages for BSE education, Howe (1981b) examined multiple variables influencing the adoption of BSE practice following mass media messages. Remembering to perform BSE, detection confidence, and social support were found to have significant t values. She concluded the type of message used to inform the subjects about BSE did not result in significantly different patterns of adoption of the practice.

Edwards (1980) studied the affect of four methods of instruction on changing BSE behavior. Using the group taught by modeling alone as the control, she compared subjects taught by modeling plus guided practice, modeling plus self-monitoring, and modeling plus peer support. Among subjects recruited at a publicly supported cancer screening clinic, she found no difference in the results based on the different methods of teaching. She also found no significant relationship between changes in practice and knowledge and socioeconomic levels. She did find that a feeling of confidence about the ability to practice BSE was significantly related to an increase in BSE practice. Another study using modeling and guided practice as the educational intervention also found no significant differences in results (Marty, McDermott, & Gold; 1983).

A study by Mamon and Zapka (1985) targeted college students using workshops and classroom settings. The results of these educational strategies demonstrated increased proficiency and performance on a reasonably routine basis, although less impact on monthly practice was seen. Lashley's (1987) study also revealed that a BSE class increased BSE proficiency, but not frequency.

Trotta (1980) demonstrated that women taught by person-to-person techniques tended to practice more frequently, but those taught in group settings were more proficient. Group versus individual teaching increased BSE performance, but the two methods resulted in no difference in BSE frequency when compared in another study (Brailey, 1986). Three different motivational approaches to classes resulted in increased performance in all three groups, but no difference was found among the groups (Worden, Costanza, Foster, Lang, & Tidd, 1983). Another strategy designed to meet different motivational structures--affective, cognitive, and mixed--also achieved no difference in outcomes (Carter et al., 1985).

Lauver (1989), using self-regulation theory as the framework, compared the effects of four informational interventions on the frequency and thoroughness of BSE. There was no relationship between thoroughness and frequency of BSE. Those who had performed BSE prior to the

study had higher thoroughness scores than those who did not. No significant difference in frequency among the four instructional groups was found.

Hartley (1988) investigated the relationship of congruence of teaching strategy and learning style to the accuracy and frequency of the performance of breast self-examination. No significant difference was found between the congruent and incongruent learners in either frequency or accuracy.

Baker (1988b) developed a teaching strategy for older women utilizing the HBM as a theoretical base. While controlling for pretest BSE quality and age, discriminant function and regression analysis was performed. The treatment group was a significant predictor of BSE quality $t = 2.22, p = .029$.

A different type of experimental approach was formulated by Grady (1984). Cue enhancements increased BSE frequency during the experimental period, as long as the timing was accurately instituted. Postcard reminders had a more positive effect than self-management techniques.

Summary

This chapter reviewed literature in the areas of breast cancer, factors influencing BSE, the HBM as a theoretical framework, social support, intrinsic

motivation, and experimental studies involving BSE. The seriousness of breast cancer and the value of BSE has been described. The reviewed studies presented conflicting and confusing results, and the results of the studies cannot be used to consistently predict BSE performance. Neither can the results be used to identify why a woman would or would not perform BSE. Definitive BSE research needs to be based on a theoretical framework that will suggest relevant variables in order to predict the practice of BSE and identify interventions that can influence BSE practice.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

The present study utilized a descriptive, correlational research design. The aim of descriptive, correlational research is to describe the relationship among variables rather than to infer causal relationships (Polit & Hungler, 1987). A methodological component further tested instruments that have been developed for these variables. Factors associated with the frequency and competency of breast self-examination (BSE) were described. The study also examined the effectiveness of the Interaction Model of Client Health Behavior in suggesting variables for study. Relational statements from Deci's theory of self-determination were tested.

Data on the predictor and criterion variables were collected by mail methodology. The predictor variables were (a) age, (b) socioeconomic status, (c) cognitive appraisal of BSE and breast cancer, (d) affective response, (e) social support, (f) intrinsic motivation, and (g) competence in performing BSE. The criterion variables were frequency of BSE and competence in performing BSE.

Setting

The study was conducted in a large urban metropolitan city in the southwestern United States. All zip codes in the selected metropolitan area were included in the sampling frame for the selection of the subjects. The subjects completed the instruments in the settings of their choice.

Population and Sample

The accessible population for the study was adult women, 18 years and older, who lived in the selected metropolitan area. The expected effect size for the frequency of monthly was determined from the literature to be 35%. With alpha set at .01, a power of .96 could be obtained with a sample size of 200 (Cohen & Cohen, 1975). As a general rule, a sample should contain four to five times as many observations as there are variables to be analyzed for factor analysis (Hair, Anderson, Tatham, & Grablowsky, 1979). Nunnally (1978) states that 10 times as many subjects as variables would result in little sampling error. One of the instruments, the ISSB, contained 40 items; therefore, 1,250 questionnaires were mailed in an effort to obtain 400 returns. Only a 20% to 30% return can be expected with mail questionnaires (Diers, 1979; Williamson, 1981).

A systematic random sample of 1,350 addresses was obtained from a list of addresses purchased from a mail marketing firm. These firms compile mailing lists utilizing post office lists, as well as other sources. Updates are performed every 6 weeks. Every 250th name was requested from the population of 348,987 adult women.

A postcard was included in the first mailing which was to be returned if the recipient wanted to participate. The recipient could also indicate if she wanted a copy of the results and/or wanted an instructional pamphlet on BSE. These returned post cards were compared against the original addresses to determine those subjects needing reminder cards. In an effort to increase the return rate, a reminder postcard was sent to those who did not return the questionnaire within 2 weeks. A decaffeinated coffee sample and coupon were also included with the questionnaire to increase participation (Dillman, 1978).

The cover of the questionnaire was also designed according to a suggestion by Dillman (1978). The title, "Breast Self-Examination," was chosen to impart the topic of the study in a few words. The subtitle, "This survey will gather information for the fight against cancer of the breast," was chosen to convey the research nature of the project. A graphic illustration of several women engaged in daily activities was added to increase interest in the

contents of the questionnaire. The return address of the project was included in case the reply envelope was separated from the questionnaire. The name of the researcher was not included in the return address on the questionnaire cover. Dillman (1978) asserts that the respondent should view the researcher as an intermediary between the respondent and the accomplishment of a socially useful activity.

The cover letter also used techniques suggested by Dillman (1978). The letter emphasized the importance of the response of the subject as well as the usefulness of the study. The subject was assured of confidentiality. The decaffeinated coffee sample and the coupon were mentioned as tokens of appreciation. The name and phone number of the researcher were provided if the subject had questions. The letter was individually addressed and signed by hand. The letter requested the completion of the questionnaire by females who were at least 18 years of age.

Protection of Human Subjects

This study falls under Category I (no risk) of the Federal guidelines for research with human subjects, as it was limited to use of an anonymous questionnaire that was administered to adults. Thus, the study was exempt from review by the Human Subjects Review Committee (Appendix A).

Prior to initiation of the study, permission was obtained from the Graduate School of the University (Appendix B).

A guarantee of anonymity was expressed in the cover letter containing the written explanation of the study (Appendix C). Subjects were requested not to place their names on the questionnaires in order to maintain anonymity of the responses. The cover letter stated that return of the completed questionnaire was considered as consent to act as a participant in the study. Each questionnaire also contained the following statement: RETURN OF THIS QUESTIONNAIRE WILL BE CONSIDERED AS CONSENT TO PARTICIPATE IN THIS STUDY.

Instruments

There were six instruments used in this study: a researcher-developed tool for demographics (Appendix D), the Champion Knowledge Scale (Appendix E), the Lashley BSE Techniques Questionnaire (Appendix F), the Lauver BSE Scales (Appendix G), the Inventory of Social Supportive Behaviors (Appendix H), and the Health Self-Determinism Index (Appendix I). Each tool had a separate set of instructions. The instruments were combined into a six-part tool (Appendix J). The combined instrument was formatted according to suggestions by Dillman (1978) in order to increase interest in completion by the subjects.

All the instruments were determined by the Grammatick IV software program to be at the third to sixth grade reading level. According to Glazer-Waldman (1984), these instruments should be compatible with the reading level of this population.

Demographic Sheet

The demographic sheet was developed by the researcher based on the literature review, Deci's theory of intrinsic motivation, and the Interaction Model of Client Health Behavior. The questions determined age, race, marital status, gross family income, years of education, and religion. The variables of education and family income were used to compute the Green Socioeconomic Indices. While age and education have been correlated with BSE practice, the other variables were included in order to determine how the data from the sample compared to the census data.

For this study, the socioeconomic score was computed using the data from the demographic sheet and the equation from the Green SES Indices. Level of education and the gross family income were compared to nationally standardized tables. The number obtained was multiplied by the appropriate factor (education = .7, income = .4), and

then added together to derive the score. The range of possible SES scores was 30 to 85 (Green, 1970).

The Green SES Indices were originally developed from stepwise regression analyses on data from a statewide sample ($N = 1,592$) of California families with at least one child under 5 years of age (Green, 1970). The criterion variable in the regression analysis was a composite index of nine types of preventive health behaviors. The independent variables were family income, educational level of the female in the household, and occupation of the main wage earner. Educational level may be combined with either income or occupation with less than a 4% loss of predictive validity. The indices are intended to optimize the prediction of family health actions from socioeconomic information. The multiplication factors used were the actual correlation coefficients obtained in the original sample.

Champion Knowledge Scale

In this study, the Champion Knowledge Scale was used to measure cognitive appraisal and the frequency of BSE. The Champion Knowledge Scale measures the subject's knowledge of the procedure of BSE, risk factors for breast cancer, treatment, and outcome (Champion, 1988).

A total of 25 multiple choice questions were developed based upon the Opinion Research Poll and a pamphlet from the American Cancer Society. The correct responses are totaled to determine the score which can range from 0 to 25. Champion (1988) found internal consistency reliability, Cronbach's alpha, to be greater than .64.

Lashley BSE Techniques Questionnaire

The Lashley BSE Techniques Questionnaire was designed to assess the competence with which subjects perform breast self-exam (Lashley, 1987). The 14-item checklist was based on the American Cancer Society's and the National Cancer Institute's recommendations for the performance of the technique. Scores on the BSE technique scale range from 0 to 14, with 14 indicating complete performance of all the recommended BSE steps.

The developer submitted the instrument to a panel of three registered nurses who were currently enrolled in a master's level nurse practitioner program (Lashley, 1987). All reported teaching BSE to patients, while one was a BSE instructor certified by the American Cancer Society.

The test-retest reliability of the instrument was originally conducted on a convenience sample of 18 female graduate students in nursing, aged 24 to 47 years. A reliability coefficient of .85 was obtained. To measure

internal consistency, an alpha coefficient was computed and found to be .77 (Lashley, 1987).

Lauver BSE Scales

The Lauver BSE Scales measure women's feelings of comfort with self-touch and examination and difficulty in remembering to perform BSE (Lauver & Angerame, 1988). Subjects indicate disagreement or agreement with the items in each scale on a 5-point response set. The appropriate item responses for each scale are summed and divided by the number of related items; for negatively worded items, scores are reversed. The remembering scale is composed of four items and the comfort scale has six items. The remembering scale has three negatively worded questions and the comfort scale is evenly divided between positively and negatively worded questions.

Lauver (1987) assessed content validity by submitting the instrument to 20 nurses from faculty in women's health care, clinicians in oncology nursing, and postdoctoral fellows. Ninety-five percent of the nurses judged the items to be relevant, 85% judged the representation of attitudes about BSE to be adequate, and 85% judged there to be an even distribution of items across content areas. Cronbach alpha coefficients were determined for each scale as follows: remembering - .70, comfort - .80.

Inventory of Social Supportive Behaviors

The Inventory of Social Supportive Behaviors (ISSB) is a self-report measure of 40 items on a Likert scale (Barrera et al., 1981). The ISSB is designed to assess how often individuals received various forms of assistance during the preceding month. Subjects are asked to rate the frequency of each item on a 5-point scale (1 = not at all, 2 = once or twice, 3 = about once a week, 4 = several times a week, 5 = about every day). The 5-point ratings of each item are summed to form a total frequency score. Scores can vary from 40 to 200. High scores indicate a high degree of social support.

The internal consistency reliability of the ISSB has been consistently determined to be above .90 (Barrera, 1981; Barrera et al., 1981; Cohen & Hoberman, 1983; Cohen, McGowan, Fooskas, & Rose, 1984; Stokes & Wilson, 1984). Test-retest reliability over a 1 month period was assessed as .80 for undergraduate students (Barrera & Ainlay, 1983) and .63 for female graduate students (Valdenegro & Barrera, 1983). House and Kahn (1985) contended that use of the ISSB in populations other than college students has not been fully examined.

Criterion validity has been determined for the ISSB by examining correlations between scores on the ISSB and scores on other measures of social support. These

correlations have varied between .24 and .42 with measures of social network size (Barrera, 1981; Sandler & Barrera, 1984; Valdenegro & Barrera, 1983). Other validity studies have examined the factor structure of the ISSB (Barrera & Ainlay, 1983; Stokes & Wilson, 1984). There is considerable agreement between these studies for the existence of clusters that can be labeled guidance, emotional support, and tangible support. The subscale of guidance has 12 items, emotional support has 13, and tangible assistance has 6.

Barrera (1985) has viewed the ISSB as a measure of social support received and as an appropriate measure of support mobilization or aid provision. This tool measures a concept that is different from qualitative measures of support, such as support satisfaction or perceived availability of social support. The ISSB is in the public domain and can be used for research purposes without charge and may be reproduced.

Health Self-Determinism Index

The Health Self-Determinism Index (Cox, 1985) is a measure of the motivational subsystem and causality orientation components of health behavior. This tool was developed in an effort to determine an important and potentially manipulable characteristic of the health care

consumer. The measure is intended to be sensitive to the type and strength of the individual's current motivational status. The construct is multi-dimensional, but also displays the relative strength of the intrinsic-extrinsic continuum within each dimension.

The Health Self-Determinism Index (HSDI) is composed of 17 Likert items evenly divided over the four subscales representing the components of the intrinsically motivated person: self-determinism in health judgment, self-determinism in health behavior, perception of competency in health matters, and responsiveness to internal/external cues. Half of the items are worded so that strongly agree indicates a strong sense of self-determinism and competency, with the other half worded more extrinsically. No two consecutive items are from the same scale and no more than two consecutive items are keyed in the same direction. The items are on a 5-point scale, with 5 representing the most intrinsic response on the intrinsic items and 5 representing the most extrinsic response on the extrinsic items. For scoring, all the extrinsic items are reverse scored (Cox, 1985). The range of scores is from 17 to 85.

Initially, content validity of the HSDI was determined by graduate students in nursing and psychology as well as graduate teaching faculty in nursing and psychology (Cox,

1985). The HSDI was then administered to a convenience sample of 31 volunteers--16 professional teachers, 9 health professionals, and 6 skilled laborers. The item means indicated no ceiling or floor effects. A Cronbach's alpha of .82 for the entire scale was obtained. New items replaced items with low item-total correlations. These items were reviewed by experts in survey research questionnaire construction and were administered to a convenience sample of 10. Response variance and item clarity were established.

Cox (1985) mailed the HSDI to a randomly selected sample of 345 addresses taken from the phone book. The population was oversampled by 45% to allow for nonresponse. Of the 202 who completed the questionnaire, 91 were males and 111 were females. With the exceptions of age and racial distribution, the sample was comparable to the total population of the midwest county that was used in the study.

Cox (1985) utilized factor analysis to examine the multidimensionality of the instrument. An eigenvalue of 1 or greater determined which factors were meaningful to extract and rotate. A four factor solution was able to account for 56% of the variance of the measure. A minimum factor loading of .30 resulted in 15 of the 16 items loading on one of the four factors. The number of items

for each factor was as follows: self-determinism in health judgement included 5 items, self-determinism in health behavior included 6 items, perceived competency in health matters included 3 items, and internal/external cue responsiveness included 4 items. The factors clearly represent the motivational constructs developed in the theoretical framework.

Those items that loaded significantly on the four factors were examined for their internal consistency as subscales. Cronbach's alpha for each subscale were: Factor I = .75, Factor II = .75, Factor III = .67, Factor IV = .69. The average inter-item correlations for the subscales were .52, .51, .51, and .49, respectively. These correlations suggest that the items loading on each factor corresponded well with that factor.

Pilot Study

A pilot study was conducted to test the stability of the instruments as well as to assess the instructions and the length of time required to complete the questionnaire. Out of the total mailing list of 1,350 names obtained for the sample, every 13th name was selected for the pilot. Questionnaires were mailed to these 100 subjects. The subject was requested to return the enclosed postcard if she was willing to complete the questionnaire at that time

and again in 2 weeks. The subject was also asked to indicate on the postcard if she wanted an instructional pamphlet on breast self-examination and a summary of the results of the study. After 1 week, a reminder postcard was sent to the pilot group.

Two questionnaires were returned due to incorrect addresses, one subject refused to participate, and one subject returned the questionnaire because she had undergone a bilateral mastectomy. Of the 36 women who returned the first round of questionnaires, only 19 returned the second questionnaire and one of these was incomplete. Only 18 questionnaires were used for data analysis. The pilot sample was more highly educated and older than the population. Also, all of the subjects were married.

The instructions required no revision. The average time reported to complete the questionnaire was 30 minutes. Stability was assessed using Pearson correlation coefficient to test each of the instruments. The results were: the Champion Knowledge Scale, $r = .80$, $p = .005$; the Lashley BSE Techniques Questionnaire, $r = .75$, $p = .05$; the Lauver BSE, $r = .76$, $p = .03$; the Inventory of Social Supportive Behaviors, $r = .88$, $p = .001$; the Health Self-Determinism Index, $r = .84$, $p = .002$; and the Green Socioeconomic Indices, $r = .98$, $p = .001$.

Internal consistency was examined for each separate instrument using Cronbach's alpha. The Champion Knowledge Scale exhibited an $r = .88$, the Lashley BSE Techniques Questionnaire an $r = .87$, and the Green SES Indices an $r = .99$.

Data Collection

The research was conducted during the summer of 1989. The questionnaires were mailed with a stamped return envelope to 1,250 randomly selected households. Any adult female, 18 or over, in the household was asked to complete and return the questionnaire. A postcard was included. The subject was asked to mail the postcard if she intended to complete the questionnaire. Reminder postcards were mailed to those not returning the postcard after 2 weeks.

Treatment of Data

Data from the demographic instrument were analyzed using descriptive statistics and the Spearman rank order correlation coefficient. Demographic data of the subjects who returned the questionnaires were compared against census data to determine representativeness (Polit & Hungler, 1987).

The first research hypothesis was tested by using discriminant analysis to determine if the predictor variables would discriminate between the levels of the

criterion variable of frequency of BSE. Additionally, Spearman rank order correlations were performed to investigate the relationships between the subscales of the Lauver BSE Scales and frequency of BSE.

Multiple regression procedures were performed to test the second research hypothesis which examined the relationship of the predictor variables to competency in BSE. Pearson's correlation coefficient was used to determine the relationship between the subscales of the Lauver BSE Scales and competency in BSE. The alpha level was set at .01 for testing of the hypotheses.

Spearman rank order correlation coefficient was also employed to test the third and fourth hypotheses. These hypotheses postulated relationships between the HSDI scores and the BSE frequency scores and between the BSE competency scores and the BSE frequency scores. The Likert scales and summed item totals were considered interval level data for these tests.

Cronbach's alpha was computed to determine internal consistency for the Lashley Breast Techniques Questionnaire, the Champion Knowledge Scale, and the subscales of the Lauver BSE Scales, the HSDI, and the ISSB. The HSDI, the Lauver BSE Scales, and the ISSB were factor analyzed to enhance construct validity. Spearman rank order correlation coefficient was used to determine the

relationship between demographic data and the criterion and predictor variables.

CHAPTER IV

ANALYSIS OF DATA

This chapter discusses the analysis of the data gathered for the study. Data were collected by mail methodology as described in the section on the procedure for collection of data. The sample is described followed by analysis of data collected to test the study hypotheses and answer the research questions.

Description of the Sample

A total of 1,250 questionnaires was mailed to women, 18 years of age and older, in a city in the southwestern United States. A total of 302 questionnaires were returned. Forty questionnaires were returned because of inaccurate addresses. Three subjects refused to participate. Seven questionnaires were incomplete, and three questionnaires were returned because the subjects had undergone bilateral mastectomy. This resulted in a sample of 249 and a useable questionnaire response rate of 21.65%.

The sample was older, more affluent, better educated, and more apt to be married than the population from which the sample was drawn. The majority of the sample respondents was 31 to 45 years of age (Table 1). The

Table 1

Distribution of the Sample by Age

Age	Frequency	Percent
18-30	40	16.1
31-45	97	39.0
46-60	59	23.7
61-75	48	19.3
76-	2	0.8
Missing Cases	<u>3</u>	<u>1.2</u>
Totals	249	100.0

has a greater number in the range of 18-30 years (Bureau of Census, 1980). Only 48% of the population was married, although most of the sample were married (Table 2). Only 3.2% of the sample was divorced or separated. Almost 16% of the population fell into this segment.

More than half of the sample reported a family income of greater than \$25,000 per year (Table 3). Only 28% of the population was in this group (Bureau of Census, 1980). Those making less than \$10,000 per year were also not well represented. Only 5.7% specified this level of income, compared to 28% of the population.

Table 2

Distribution of the Sample by Marital Status

Marital status	Frequency	Percent
Never Married	13	5.2
Married	210	84.4
Separated/Divorced	8	3.2
Widowed	9	3.6
Living with Significant Other	3	1.2
Missing Cases	<u>6</u>	<u>2.4</u>
Totals	249	100.0

The sample reflected a highly educated group with 67.4% reporting one or more years of college (Table 4). In the population, only 40.8% had attended college (Bureau of Census, 1980).

The majority of the sample (183 or 73.5%) was Caucasian (Table 5). Blacks made up the next largest group (41 or 16.5%). The population actually was comprised of 61.4% Caucasian and 24.38% Black.

Most of the sample indicated their religion as Protestant (173 or 72.2%). The next largest group was

Table 3

Distribution of the Sample by Family Income

Income	Frequency	Percent
Less than \$10,000	14	5.7
\$10,000-12,999	12	4.8
\$13,000-14,999	3	1.2
\$15,000-24,999	31	12.4
\$25,000-34,999	43	17.3
\$35,000-49,999	40	16.1
\$50,000-	90	36.1
Missing Cases	<u>16</u>	<u>6.4</u>
Totals	249	100.0

Catholic (10 or 4.2%). Comparison statistics were not available from the Census Bureau.

Of the sample, 202 (81.1%) women reported performing breast self-examination during the last year. However, only 94 (37.8%) indicated monthly examinations to observe for lumps that might be cancer. When asked a more specific question regarding examination frequency, only 55 (22%) claimed to examine monthly (Table 6). In the sample,

Table 4

Distribution of the Sample by Highest Level
of Education

Level	Frequency	Percent
1st-2nd Grade	1	0.4
3rd-4th Grade	1	0.4
5th-6th Grade	2	0.8
7th-8th Grade	5	2.0
9th Grade	3	1.2
10th Grade	3	1.2
11th Grade	10	4.0
12th Grade	52	20.9
1 Year College	30	12.0
2 Years College	28	11.2
3 Years College	13	5.2
4 Years College	35	14.1
5 or More Years College	58	23.3
Missing Cases	<u>8</u>	<u>3.3</u>
Totals	249	100.0

Table 5

Distribution of the Sample by Ethnic Group

Ethnic group	Frequency	Percent
Caucasian	183	73.5
Black	41	16.5
Hispanic	15	6.0
Asian American	2	0.8
American Indian	2	0.8
Missing Cases	<u>6</u>	<u>2.4</u>
Totals	249	100.0

The average woman had first performed breast self-examination 10.89 years ago.

When asked how often breast self-examination had been performed during the last 3 months, 64 (26%) checked not at all. Of those who had performed an examination, 55 (22.4%) had performed BSE once each month (Table 7). This correlated with the percentage of women who had stated they had examined once per month during the last year. However, the percentage of women who stated they had not practiced BSE at all during the last year was 15.8% compared to the 26% who had not examined at all during the last 3 months.

Table 6

Frequency of Breast Self-Examination

Frequency of examination	Frequency	Percent
Not At All	39	15.8
1-2 Times Per Year	30	12.2
3 Times Per Year	29	11.8
4 Times Per Year	34	13.8
Every Other Month	37	15.1
Once a Month	55	22.4
Twice a Month	<u>22</u>	<u>8.9</u>
Totals	246	100.0

Findings

Six instruments were utilized in the collection of data, as described in the section on data collection procedures. These were the researcher-developed demographic sheet, the Champion Knowledge Scale, the Lashley BSE Techniques Questionnaire, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors (ISSB), and the Health Self-Determinism Index (HSDI). The Champion Knowledge Scale measured both the knowledge of breast cancer and BSE as well as to measure the frequency of BSE performance. The Lashley BSE Techniques

Table 7

Frequency of Breast Self-Examination During
Last Three Months

Frequency of examination	Frequency	Percent
Not At All	64	26.0
Once During Three Months	71	28.9
Twice	30	12.1
Three Times	55	22.4
Four Times	<u>26</u>	<u>10.6</u>
Totals	246	100.0

Questionnaire measured competency in performing BSE. The Lauver BSE Scales measured the affective response of forgetting and comfort to performing BSE. The ISSB measured the level of social support experienced by the subject in the last 4 weeks. The HSDI measured the intrinsic motivation in health matters. The Green SES Indices procedures were used to compute the socioeconomic status of the subjects from the data obtained on the demographic sheet. Table 8 summarizes the minimum score, maximum score, mean, and standard deviation of the instruments and their subscales.

Hypothesis one stated: There is a predictive relationship between age, socioeconomic status, cognitive appraisal, affective response, social support, intrinsic motivation, competence of breast self-examination, and frequency of breast self-examination by adult women. Discriminant analysis procedures were performed to analyze this hypothesis since the dependent variable, frequency of breast self-examination, was measured at an ordinal level. Frequency of BSE was divided into seven different groups. According to Shelley (1984), discriminant analysis can be used to predict group membership when the dependent variable is either nominal or ordinal. Discriminant analysis is the appropriate statistical technique for testing the hypothesis that the group means of two or more groups are equal (Hair et al., 1979). To do this, discriminant analysis multiplies each independent variable by its corresponding weight and adds these products together. The result is a single composite discriminant score for each individual in the analysis. By averaging the discriminant scores for individuals within a particular group, a group mean is determined. This group mean is described as the centroid. The centroids indicate the most typical location of an individual from a particular group.

Table 8

Minimum Score, Maximum Score, Mean, and Standard Deviation
of the Instruments

Scale	Minimum	Maximum	Mean	<u>SD</u>
Champion Knowledge	3	24	16.52	3.75
Lashley Competency	0	17	8.96	3.49
Lauver Attitude(Total)	11	50	35.95	6.38
Comfort	11	30	25.19	6.32
Remembering	0	20	10.74	4.16
ISSB (Total)	0	131	44.98	23.53
Guidance	0	44	13.13	8.37
Emotional Support	0	55	24.18	12.39
Tangible Assistance	0	33	7.90	5.58
HSDI (Total)	5	78	55.87	9.64
Health Judgement	0	29	19.73	3.98
Health Behavior	5	24	16.50	2.95
Competency	0	15	10.01	2.52
Internal/External Cues	0	15	9.88	2.51
Green SES Indices	34.6	76.6	64.83	9.05

The sample size was less than desired but adequate for the statistical tests used. Cohen and Cohen (1975) state that the larger the N , the greater is the statistical power. The actual effect size for frequency of monthly BSE was $r = .38$. In this study, the alpha was set at .01. The resulting power exceeds .96, with the sample of 249.

The independent variables of competence, affective response, and age contributed to the discrimination of the functions as demonstrated in Table 9. These variables were measured, respectively, by the Lashley Breast Techniques Questionnaire, the Lauver BSE Scales, and the demographic sheet. The variable of competence provided the most discriminating power as denoted by the F -values. These three variables accounted for 68% of the variance. Wilkes' lambda indicates the proportion of the variance for which the independent variable does not account (Pedhazur, 1982).

The first hypothesis was supported. A predictive relationship was demonstrated between competence in breast self-examination, affective response, age, and the dependent variable, frequency of breast self-examination.

Table 9

Stepwise Discriminant Analysis Summary Table of Age, SES, Champion Knowledge Scale, Lauver BSE Scales, ISSB, HSDI, Lashley BSE Techniques Questionnaire, on Frequency of BSE

Variable	Canonical coefficient	Wilkes lambda	F value
Step 1			
Lashley BSE Techniques	.39	.40	59.10
Step 2			
Lauver BSE Scales	.01	.36	5.27
Step 3			
Age	.24	.32	4.44

Note. All significant at the .01 level.

The discriminant function was significant at an eigenvalue of 1.56. Competency, as measured by the Lashley BSE Techniques Questionnaire, had a negative function coefficient in the group who never practiced BSE and a positive coefficient in the group who practiced monthly (Table 10). Although some variation existed, the function coefficient for competency increased with the increase in the frequency of BSE.

Table 10

Discriminant Classification Function Coefficients of the
Lashley BSE Techniques Questionnaire, Lauver BSE Scales,
and Age by Frequency of BSE

Groups	Lashley	Lauver	Age
Not At All	-.45	1.12	3.03
1-2 Times Per Year	0.71	1.02	3.31
3 Times Per Year	0.76	0.97	2.80
4 Times Per Year	0.87	1.05	3.25
Once Every Other Month	0.85	1.09	3.75
About Once Per Month	0.96	1.18	3.87
Twice A Month or More	1.04	1.20	4.09

Note. All significant at the .01 level.

The relationship of the Lauver BSE Scales was more complex. The coefficient demonstrated a curvilinear relationship with frequency of BSE. The coefficient for age was significantly higher at the higher levels of BSE frequency than for the group who did not practice BSE.

The relationship between the subscales of the Lauver BSE Scales and the frequency of BSE was also evaluated using the Spearman rank order correlation coefficient. The subscale of Comfort was significantly related to the

frequency of BSE, $r_s = .19$, $p = .003$. The subscale of Remembering also demonstrated a relationship with BSE frequency, $r_s = .52$, $p = .0001$.

The second hypothesis stated: There is a relationship between (a) age, (b) socioeconomic status, (c) cognitive appraisal, (d) affective response, (e) social support, (f) intrinsic motivation, and competence in the performance of breast self-examination by adult women. In order to analyze this hypothesis, multiple regression procedures were performed.

As demonstrated in Table 11, two of the independent variables were predictive of competence in performing BSE. These variables were cognitive appraisal or knowledge, as measured by the Champion Knowledge Scale, and affective response, as measured by the Lauver BSE Scales. These two variables explained only 25% of the variance. None of the other variables entered the equation. This hypothesis was accepted.

Additionally, the relationships between BSE competence and the subscales of the Lauver BSE Scales were examined to determine the relationship of each. Competence was significantly related to both Comfort, $r = .32$, $p < .001$; and Remembering, $r = .41$, $p < .001$.

Table 11

Stepwise Multiple Regression with Age, Champion BSE Knowledge Scale, Lauver BSE Scales, ISSB, HSDI, and Green SES Indices on the Lashley Breast Technique Questionnaire

Variable	<u>B</u>	SE-B	<u>F</u> -ratio	Prob.
Step 1				
Lauver Scales	.20	.39	32.72	<.001
Step 2				
Champion Knowledge	.24	.23	11.41	<.001
	Multiple R^2		Increase in RSQ	
Lauver Scales	.45	.21	.21	
Champion Knowledge	.50	.25	.05	

The third hypothesis stated that: The more competent adult women are in the performance of breast self-examination, the higher is the frequency of breast self-examination. This hypothesis was examined using the Spearman rank order correlation coefficient because the variable, frequency of BSE, was measured at the ordinal level. The hypothesis was supported as the relationship was significant, $r_s = .51$, $p = .007$.

The fourth hypothesis stated: The more intrinsically motivated are adult women, the higher is the frequency of breast self-examination. This was also examined using the Spearman correlation coefficient. The relationship was not significant at the .01 level, $r_s = .15$, $p = .02$.

The research questions addressed the psychometric properties of the instruments. The first question was: What are the test-retest reliability coefficients for the Champion Knowledge Scale, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, the Health Self-Determinism Index, and The Lashley Breast Techniques Questionnaire? This question was addressed during the pilot phase and the results were included in the previous chapter.

The second research question was: What are the internal consistency reliability coefficients for the Champion Knowledge Scale, the Lashley BSE Techniques

Questionnaire, and the subscales of the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index? Cronbach's alpha was performed on each of the single dimension instruments and each of the subscales of the multidimensional instruments, as identified in previous research (Barrera & Ainley, 1983; Cox, 1985; Lauver, 1988)

The criterion level used for coefficient alpha with new psychosocial scales is .70 or above; for mature scales is .80 or above; and for applied research, where important decisions are being made, .90 or above (Nunnally, 1978). The Lashley BSE Techniques Questionnaire, the Green SES Indices, the subscales of the Lauver BSE Scales, and two of the subscales of the ISSB reached the criterion level of .80 for mature scales. None of the subscales of the HSDI nor the Tangible Assistance subscale of the ISSB reached the criterion level for mature scales (Table 12). Only one of the HSDI subscales, Competency in Health Matters, and the Champion Knowledge Scale reached the criterion level of .70, which has been established for newly developed instruments.

The third research question was: What are the inter-item correlations and the item-scale/subscale correlations of the items contained in the Champion

Knowledge Scale, the Lashley BSE Techniques Questionnaire, the Lauver BSE Scales, the ISSB, and the HSDI? Inter-item correlations should range from $r = .30$ to $.70$ to be high enough to index similar content, yet low enough to avoid redundancy (Hinshaw & Atwood, 1982). Item-scale/subscale correlations should be in the range of $.50$ to $.70$.

Only three items, 18, 20, and 21, on the Champion Knowledge Scale reached the item-scale criterion of $.50$ (Table 13). Only items 18, 19, 20, 21, 22, 23, and 25 achieved inter-item correlations of $.30$. Item 18 asked whether women whose mothers and sisters have had breast cancer were more likely to have breast cancer. Another question that correlated with the scale total asked whether fondling or caressing could cause breast cancer. Item 21 asked if a mastectomy was a test or a treatment. Most women believed that early detection of breast cancer improved the chance for recovery. The item mean was $.98$, indicating almost everyone knew the correct answer. Correct answers were coded 1 and incorrect answers were coded 0. Another question answered correctly by most women defined a mammogram as an x-ray of the breast.

The investigation of the other single dimension instrument, the Lashley BSE Techniques Questionnaire, revealed that all except two of the items, 4 and 7,

Table 12

Internal Consistency of Each Instrument

Instrument	Cronbach's Alpha
Champion Knowledge Scale	.78
Lashley BSE Technique	.86
Lauver BSE Scales	
Comfort	.80
Remembering	.82
ISSB Subscales	
Guidance	.88
Emotional Support	.91
Tangible Assistance	.76
HSDI Subscales	
Health Judgement	.69
Health Behavior	.67
Internal-External Cues	.64
Competency	.70

achieved item-scale correlations of .50 to .70, respectively (Table 14). These two items addressed viewing the breasts in the mirror during the examination and placing a towel under the shoulder when lying down to examine the breasts. Neither of these two items achieved

Table 13

Champion Knowledge Scale: Item-Scale Correlations

Item	<u>r</u>
1	.39
2	.35
3	.48
4	.36
5	.46
6	.17
7	.25
8	.43
9	.34
10	.42
11	.18
12	.43
13	.32
14	.41
15	.27
16	.35
17	.32
18	.56
19	.49
20	.62
21	.51
22	.35
23	.38
24	.32
25	.45

Note. All significant at $< .001$ level.

the inter-item correlation criterion of .30 to .70. Items 1, 13, and 14 consistently manifested inter-item correlations below .30. Item 1 asked if the woman examined her breasts in the bath or shower. Item 13 determined if the woman examined the armpit area. The last item inquired

if the woman squeezed the nipple to detect discharge. The other items correlated with most other items at the criterion level of .30 to .70.

Table 14

Lashley BSE Techniques: Item-Scale Correlations

Item	<u>r</u>
1	.53
2	.55
3	.65
4	.46
5	.68
6	.63
7	.40
8	.64
9	.67
10	.69
11	.59
12	.61
13	.54
14	.57

Note. All significant at $< .0001$ level.

Lauver and Angerame (1988) described the Lauver BSE Scales as a two dimension instrument composed of the Comfort Subscale and the Remembering Subscale. All but one item on both subscales attained the item-subscale criterion of .50 (Table 15). However, all but three exceeded the .70

Table 15

Lauver BSE Scales: Item-Subscale Correlations

Item	<u>r</u>
<u>Comfort Subscale:</u>	
1	.30
3	.73
6	.79
7	.75
8	.69
9	.57
<u>Remembering Subscale:</u>	
2	.83
4	.77
5	.75
10	.88

Note. All significant at < .0001 level.

criterion. Only two items, 1 and 9, on the Comfort Subscale failed to reach the inter-item correlation criterion of .30 to .70. Item 1 stated, "I am comfortable in looking at my breasts in great detail." Item 9 stated,

"I don't think I should touch my breasts." Both of these items correlated at a minimum of $r = .29$.

Barrera and Ainlay (1983) characterized the ISSB as a three dimension instrument. All of the items on the subscale of Guidance fell in the range of the item-subscale criterion of .50 to .70 (Table 16). Of the 91 inter-item correlations, 26 did not reach the .30 to .50 criterion. These pairs were distributed throughout the items.

All of the items on the ISSB subscale, Tangible Assistance, also achieved the criterion for the item-subscale correlation (Table 16). Only 9 of the 55 inter-item correlations met the .30 to .70 criterion.

Of the 15 item-subscale correlations on the third subscale of the ISSB, Emotional Support, 7 were greater than .70. The other 8 fell in the criterion range (Table 16). Eighteen of the 105 inter-item pairs fell below the .30 criterion.

Cox (1985) asserted that the HSDI contains four factors. These subscales were evaluated for inter-item correlations and item-subscale correlations. The subscale items of Self-Determinism in Health Judgement achieved the item-subscale criterion of .50, although one item exceeded the .70 level (Table 17). Of the 15 pairs, only 6 inter-item correlations fell in the .30 to .70 range.

Table 16

Inventory of Social Supportive Behaviors: Item-Subscale
Correlations

Item	<u>r</u>
<u>Tangible Assistance Subscale:</u>	
1	.55
4	.60
9	.57
17	.61
20	.67
22	.53
25	.55
34	.26
38	.59
39	.48
40	.30
<u>Guidance Subscale:</u>	
5	.56
12	.58
13	.57
15	.61
16	.63
19	.65
21	.64
23	.64
27	.65
28	.63
32	.63
33	.71
35	.59
36	.62

(table continues)

Item	<u>r</u>
<u>Emotional Support Subscale:</u>	
2	.56
3	.45
6	.55
7	.72
8	.73
10	.75
11	.49
14	.72
18	.68
24	.68
26	.69
29	.76
30	.77
31	.73
37	.64

Note. All significant at $< .0001$ level.

The subscale of Self-Determinism in Health Behavior consisted of only five items. Three items reached the item-subscale correlation of .50 and two extended beyond the .70 level (Table 17). Only 4 of the 10 pairs fell in the .30 to .70 inter-item criterion range.

All of the items on the Internal/External Cues subscale exceeded the .70 item-subscale range (Table 17). Two of the three pairs met the .30 to .70 inter-item criterion level.

Of the three items on the Competency in Health Matters subscale, all surpassed the .50 item-subscale

criterion level (Table 17). All three of the inter-item pairs fell in the .30 to .70 range.

The instruments with more than one dimension were factor analyzed to determine if the dimensions could be described differently or if the originally suggested dimensions would be accepted. Factor analysis with varimax rotation procedures were performed using the Statpac Gold computer program.

A conservative ratio suggested is four to five times as many observations as there are variables to be analyzed (Hair et al., 1979). Nunnally (1978) stated that 10 times as many subjects as variables would result in little sampling error. With the longest instrument having 40 items, the ideal sample size for this study would have been 400. The smallest sample size to be adequate would have been 160 to 200. Although the actual sample of 249 fell below the ideal, it was above the minimum suggested level.

When factor analyzed, the Lauver BSE Scales, confirmed the structure that Lauver and Angerame (1988) originally suggested (Table 18). All items loaded above the criterion level of .30, ranging from .46 to .95. The factors are differentiated into the Remembering and Comfort subscales. These two scales accounted for 53% of the variance in the instrument.

Table 17

Health Self-Determinism Index: Item-Subscale Correlations

Item

rSelf-Determinism in Health Judgement Subscale:

1	.52
3	.62
6	.64
8	.73
10	.54
16	.66

Self-Determinism in Health Behavior Subscale:

2	.59
7	.65
12	.59
15	.73
17	.72

Internal/External Cue Responsiveness Subscale:

5	.76
11	.78
14	.73

Perceived Competency in Health Matters Subscale:

9	.85
10	.73
13	.79

Note. All significant at $< .0001$ level.

The ISSB, when factor analyzed, presented a five factor structure, rather than the three factors designated by the original studies as Guidance, Emotional Support, and Tangible Support (Barrera & Ainley, 1983). The factors exhibited in this study could be labeled Factor 1, General Support; Factor 2, Monetary Support; Factor 3, Tangible Support; Factor 4, Family; and Factor 5, Instruction (Table 19). All items loaded above the criterion of .30, although six items crossloaded on more than one factor.

Table 18

Lauver BSE Scales: Factor Loadings

Item	Factor 1	Factor 2
1		.64
3		.62
6		.64
7		.95
8		.46
9		.46
2	.81	
4	.71	
5	.72	
10	.94	

Table 19

Inventory of Social Supportive Behaviors: Factor Loadings

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1				.96	
2	.53				
3	.39		.36		
4	.42				
5	.51				
6	.46				
7	.68				
8	.72				
9	.39				
10	.72				
11	.47				
12	.49				
13	.40				.39
14	.73				
15	.52				.45
16	.38				.92
17	.36				
18	.67				
19	.55				
20	.38		.40		
21	.49				
22	.33	.39			
23	.45				
24	.67				
25	.41				
26	.72				
27	.65				
28	.60				
29	.77				
30	.82				
31	.74				
32	.51				
33	.59				
34		.50			
35	.46				
36	.54				
37	.66				
38			.96		
39	.54				
40		.98			

Cox (1985) specified that the HSDI manifested a four factor structure, Competence in Health Matters, Self-Determinism in Health Behaviors, Self-Determinism in Health Judgement, and Response to Internal-External Cues. In the present study, four factors also were demonstrated, although they are composed of different items than the original studies (Table 20). These factors could be called Factor 1, Competence in Health Matters; Factor 2, Self-Determinism in Health Behaviors; Factor 3, Extrinsic Motivation; and Factor 4, Self-Determinism in Health Judgement. These factors only accounted for 48% of the variance in the instrument. Because all of the factor loadings were high, a criterion of .40 was chosen. Two items still loaded on more than one factor.

In examining the correlations between the demographic variables and the predictor and criterion variables, many significant relationships were revealed, although most correlations were low (Table 21). Age was significantly related only to the Remembering subscale of the Lauver BSE Scales, $r_s = -.18$, $p = .005$, and the Competence in Health Matters subscale of the HSDI, $r_s = .17$, $p = .01$. Income manifested significant relationships to 8 of the 15 scales and subscales. The level of education exhibited relationships to all scales and subscales except the Lashley BSE Techniques Questionnaire, the Tangible

Table 20

Health Self-Determinism Index: Factor Loadings

Item	Factor 1	Factor 2	Factor 3	Factor 4
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1		.96		
2	.44			
3	.53			
4	.53			
5	.41			
6	.40		.91	
7	.42			.90
8	.58			
9		.59		
10	.50			
11	.91			
12	.46			
13		.51		
14	.46			
15	.51			
16	.64			
17	.56			

Table 21

Correlations of Demographic Variables and Predictor
and Criterion Variables

Instruments	Demographic Variables		
	Age	Income level	Education level
Champion	-.03	.38*	.37*
Lashley	.16	.01	.07
Lauver	.11	.01	.05
Comfort	-.01	.17*	.18*
Remembering	.18*	-.07	.01
ISSB	-.13	.15	.20
Guidance	.15	.12	.20*
Emotional	-.07	.17	.21*
Tangible	.05	.10	.07
HSDI	-.02	.29*	.34*
Judgement	-.09	.24*	.22*
Behavior	.03	.24*	.32*
Int/External	-.04	.33*	.31*
Competency	.17*	.19*	.28*
SES	.03	.69*	.94*
BSE Frequency	.34*	.05	.05

* $p < .01$

Assistance subscale of the ISSB, and the Lauver BSE Scales and the Remembering subscale. Frequency of BSE was related positively only to age, $r_s = .34$, $p = .0001$.

Summary of Findings

Findings of the study are summarized as follows:

1. There was a predictive relationship between (a) competence in BSE, (b) affective response, and (c) age with frequency of BSE. With a higher degree of competence, a woman exhibited a higher frequency of BSE. The affective response variable demonstrated a curvilinear relationship with frequency. In general, the older the woman, the greater the frequency of BSE practice.
2. There was a predictive relationship between cognitive appraisal and affective response with competence in BSE. Both increased affective response scores and knowledge levels were predictive of higher levels of competence in BSE practice.
3. There was a statistically significant positive relationship between competence in BSE and frequency of BSE.
4. There was no statistically significant correlation between intrinsic motivation and frequency of BSE.
5. The ISSB, the HSDI, and the Green SES Indices achieved stability coefficients of $r = .85$ to $.99$. The

Champion Knowledge Scale, the Lashley Breast Techniques Questionnaire, and the Lauver BSE Attitude Scale exhibited stability coefficients of $r = .75$ to $.85$.

6. The Champion Knowledge Scale, the Tangible Assistance Subscale of the Inventory of Social Supportive Behaviors, and the Competence in Health Matters Subscale of the Health Self-Determinism Index demonstrated internal consistency coefficients at the criterion level for immature instruments. The Guidance and Emotional Support subscales of the ISSB, the Lauver BSE Scales, and the Lashley BSE Techniques Questionnaire achieved the criterion for internal consistency of a mature scale. Three of the subscales of the HSDI did not evidence internal consistency at the criterion level required for immature instruments.

7. Results of the inter-item correlations and item-scale/subscale correlation of the various instruments was mixed but, in general, did not meet the criterion levels.

8. Factor analysis of the multidimensional scales revealed different structures than those originally proposed by the developers.

CHAPTER V

SUMMARY OF THE STUDY

This chapter presents a summary of the study, a discussion of the findings, and conclusions and implications. Recommendations for future research are also made.

Summary

A descriptive correlational approach was employed to determine if a predictive relationship existed between (a) age, (b) socioeconomic status, (c) cognitive appraisal, (d) affective response, (e) social support, (f) intrinsic motivation, (g) competence in performing breast self-examination, and frequency of breast self-examination by adult women. In addition, the study was designed to test relational statements from Deci's (1975) theory of self-determination. The theoretical framework for the study was based on Deci's theory. Cox's (1982) Interaction Model of Client Health Behavior suggested the variables to be included. In the present study, the following four hypotheses were tested:

1. There is a predictive relationship between (a) age, (b) socioeconomic status, (c) cognitive appraisal, (d)

affective response, (e) social support, (f) intrinsic motivation, (g) competence in performing breast self-examination, and frequency of breast self-examination by adult women.

2. There is a predictive relationship between (a) age, (b) socioeconomic status, (c) cognitive appraisal, (d) affective response, (f) social support, (g) intrinsic motivation, and competence in breast self-examination by adult women.

3. The more competent adult women are in the performance of breast self-examination, the higher is the frequency of breast self-examination.

4. The more intrinsically motivated adult women are, the higher is the frequency of breast self-examination.

In addition, the following research questions were investigated:

1. What are the test-retest reliability coefficients for the Champion Knowledge Scale, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, the Health Self-Determinism Index, and the Lashley BSE Techniques Questionnaire?

2. What are the internal consistency reliability coefficients for the Champion Knowledge Scale, the Lashley BSE Techniques Questionnaire, and the subscales of the

Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index?

3. What are the inter-item correlation coefficients and the item-scale/subscale correlation coefficients for the Champion Knowledge Scale, the Lashley BSE Techniques Questionnaire, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index?

4. What are the factors that comprise the subscales of the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, and the Health Self-Determinism Index?

Descriptive statistics were used to provide a method of comparing the sample against the population profile. Hypothesis 1 was tested using discriminant analysis. Hypothesis 2 was tested using stepwise multiple regression procedures. The Spearman rank order correlation coefficient was used to test Hypotheses 3 and 4. Pearson's r was employed to determine test-retest reliability, inter-item correlations, and item-scale/subscale correlations. Internal consistency was evaluated using Cronbach's alpha. Factor analysis with varimax rotation completed the analysis of the instruments.

The findings supported Hypotheses 1, 2, and 3. Hypothesis 4 was not supported at the .01 level of significance. In the test of Hypothesis 1, there was a predictive relationship between the three independent variables of competence, affective response, and age, and the dependent variable of frequency of BSE. These variables accounted for 68% of the variance. With a higher degree of competence, a woman exhibited a higher frequency of BSE. The affective response variable demonstrated a curvilinear relationship with frequency of BSE. In general, the older the woman, the greater the frequency of BSE practice. The relationship of the two subscales of the instrument measuring affective response, the Lauver BSE Scales, to the dependent variable was also analyzed. The subscale of Comfort was significantly related to the frequency of BSE, $r_s = .19$, $p = .003$. However, the subscale of Remembering was more highly correlated to frequency of BSE, $r_s = .52$, $p < .0001$.

Only two of the independent variables were significant in the prediction of the level of competence in BSE when testing Hypothesis 2. These variables, cognitive appraisal and affective response, explained only 25% of the variance. Again, the relationship of the subscales of the variable of affective response with the dependent variable was examined. The Comfort subscale and the Remembering

subscale were significantly correlated with competence in BSE, $r = .32$, $p = .0001$, and $r = .41$, $p = .0001$, respectively.

Hypothesis 3 was supported. Competence in BSE was significantly correlated with frequency of BSE, $r_s = .51$. This was the test of a relational statement from Deci's theory of self-determination: Perceived competence in an activity will increase the likelihood of deciding to perform the activity.

Hypothesis 4 was not supported. This was the test of another relational statement from Deci's theory: A behavior that has no external reward will more likely be exhibited by a person who is intrinsically motivated. The relationship of intrinsic motivation to frequency of BSE was not statistically significant at the $p = .01$ level, $r_s = .15$, $p = .02$.

Internal consistency reliability was confirmed for all of the instruments except the HSDI which purports to measure intrinsic motivation in health matters. Item analysis was performed on the instruments with less than desirable results for all except the Lauver BSE Scales. Except for the Lauver BSE Scales, factor analysis on the multidimensional instruments did not correspond to the results of previous studies.

Discussion of Findings

A random sample was selected in a large southwestern city. The sample was comprised of 249 women, aged 18 and over. The women were older, more highly educated, and more affluent than the population from which the sample was drawn. This limited the ability to generalize to the population as a whole.

The percentage of women in the sample performing monthly BSE, 22.4%, was similar to the 23% found in the last national survey conducted by Gallup (1987). However, the percentage of women in the sample who had performed BSE during the last year, 81.1%, was greater than that figure for the Gallup survey, 74%.

The women in the sample were not always consistent in response to the questions about the performance of BSE. When asked if they examined monthly, 37.8% of the women checked yes. The percentage of women who stated they examined monthly dropped to 22.4% when asked specifically how many times they had examined during the last year.

The variables tested in the first and second hypotheses were suggested by Cox's Interaction Model of Client Health Behavior. These variables were age, socioeconomic status, cognitive appraisal, affective response, social support, intrinsic motivation, and competence in BSE. They were measured, respectively, by

the demographic sheet, the Green SES Indices, the Champion Knowledge Scale, the Lauver BSE Scales, the Inventory of Social Supportive Behaviors, the Health Self-Determinism Index, and the Lashley BSE Techniques Questionnaire.

The independent variables of competence in BSE, affective response, and age accounted for 68% of the variance in frequency of BSE. The variable of competence in BSE provided the discriminating power. The greater the competence, the greater the frequency of BSE. Women in the group who practiced BSE frequently were older than those who did not. Those women scoring high on the affective response variable were more likely to be either nonpracticers or monthly practicers. Those scoring low on affective response tended to fall in the middle ranges of BSE practice. This might indicate that higher levels of affective response could either inhibit or encourage BSE practice. The other variables did not contribute to discrimination of the groups. Further examination of the Lauver BSE Scales revealed a significant relationship between the subscales of Remembering and Comfort with the frequency of BSE, $r_s = .52$ and $r_s = .19$, respectively. Therefore, the remembering component of the affective response contributed more than comfort to the discriminating ability of the affective response instrument.

The finding of the present study concerning the importance of the affective response is noteworthy because few other studies have demonstrated a relationship. Several studies have found no significant relationship between fear and BSE practice (Manfredi et al., 1977; Nettles-Carlson et al., 1988; Siero et al., 1984). Others have found that BSE practice was inversely related to modesty (Howe, 1981a), but not embarrassment (Nettles-Carlson et al., 1988).

Age as a predictor variable is an interesting finding. Other studies have characterized the older woman as less likely to practice BSE monthly (Howe & Hoff, 1983; Stromborg, 1986). In the Gallup study (1974), age had an inverse relationship to frequency of BSE. The relationship in the present study was direct and positive, $r_s = .34$, $p = .001$, and may reflect sampling error.

Comparisons of the results of previous studies have been difficult because of methodological problems of untested instruments, nominal level measurement, and the variations in operational definitions (Champion, 1984). Champion (1988), using valid and reliable instruments that she had developed based on the health belief model, was only able to explain 44% of the variance in frequency of BSE. In the present study, 68% of the variance was

explained. The results of the test of Hypothesis 1 supported the previous studies which had demonstrated a positive relationship between frequency of BSE and competence in performance of BSE (Bennet et al., 1983; Brailey, 1986; Calnan & Moss, 1984; Trotta, 1980).

The testing of the second hypothesis revealed that two of the independent variables were predictive of competence in BSE performance. These variables, cognitive appraisal and affective response to BSE, explained only 25% of the variance. Again, the components of the affective response instrument were evaluated because it was the most significant variable in the multiple regression equation. Competence in BSE was significantly related to both Comfort, $r = .32$, $p = .001$, and Remembering, $r = .41$, $p = .001$. The relationship of affective response and competence in BSE has not been addressed in the literature.

A study by Celentano and Holtzman (1983) found that neither income nor marital status were predictors of competence, and competence was inversely related to age. The present study only partially supports this finding. In this study, competence in BSE was related to marital status, $r_s = .35$, but not to income or age.

The outcome of the testing of the third hypothesis supported the relational statement derived from Deci's theory of self-determination: Perceived competence in an

activity will increase the likelihood of deciding to perform the activity. This corresponds to the testing of the first hypothesis which resulted in competence being identified as the primary predictor of frequency of BSE. This also supports previous studies that found competence to be related to frequency of BSE (Champion, 1988, 1989).

The fourth hypothesis was not supported. Intrinsic motivation was not found to be significantly related to frequency of BSE. This was a test of the relational statement from Deci's theory: A behavior that has no external reward will more likely be exhibited by a person who is intrinsically motivated. This outcome may have been influenced by the fact that the instrument measuring intrinsic motivation did not demonstrate adequate internal consistency.

This study found the internal consistency reliability of the Champion Knowledge Scale, .78, to be greater than the .64 reported by Champion (1988). However, inter-item correlations and item-scale correlations were less than desirable. Only 3 of the 25 items achieved the item-scale criterion of .50 to .70. Stability was only $r = .79$.

The Lashley BSE Techniques Questionnaire exhibited an internal consistency of .86, which is better than the .77 found by Lashley (1987). All but two of the items fell in the criterion levels for item-scale correlations. Three of

the items consistently failed to meet the inter-item correlation criterion. The stability correlation was .87, which corresponds to the reported .85 (Lashley, 1987)

Both of the subscales of the Lauver BSE Scales manifested internal consistency correlations similar to those reported by Lauver and Angerame (1988). The previous alphas were .80 for the subscale of Comfort, and .70 for the subscale of Remembering. The Comfort subscale demonstrated an alpha of .80 and the Remembering subscale achieved a .82 in the present study. Inter-item correlations were satisfactory, although all but two of the item-subscale correlations fell above the desirable upper level of .70. Factor analysis supported the item placement on the two subscales and the conceptual labeling. Stability testing for this instrument resulted in $r = .76$.

Stability testing of the subscales of the ISSB found an $r = .88$ for Guidance, .91 for Emotional Support, and .76 for Tangible Assistance. The stability correlation was .85 which was better than the reported .80 (Barrera & Ainlay, 1983) and .63 (Valdenegro & Barrera, 1983). The majority of the items met the criterion for the item-subscale correlations. However, many of the pairs did not meet the .30 inter-item correlation criterion. Factor analysis did not support the item placement on the scales suggested by previous studies (Barrera & Ainley,

1983; Stokes & Wilson, 1984). The interpretations made of the factors were not the same as the original developers.

The HSDI results were disappointing. While it achieved a stability correlation of greater than .85, only one of the subscales reached the internal consistency criterion for immature scales of .70. A previous study reported alphas of .75 for two of the subscales and .67 and .69 for the others (Cox, 1985). Item-subscale correlations reached the .50 criterion but several exceeded the .70 level. Cox (1985) reported average inter-item correlations of .49 to .52 for the scales. However, only 15 of the 31 pairs achieved the inter-item criterion. Factor analysis did not confirm the item loadings that Cox (1985) had suggested. The factors were interpreted differently than the original concepts.

Conclusions and Implications

The conclusions based on the present study can be applied only to the sample since the population was not adequately represented. The results supported the hypotheses drawn from Deci's theory of self-determination. The more competently a woman performs BSE, the more frequently she is apt to perform the action.

Breast self-examination performance can be predicted fairly accurately by measuring the degree of competence,

affective response, and age. Additionally, competence is related to affective response to BSE performance. Specifically, remembering and comfort in performing BSE are related to competence. Likewise, affective response is also predictive of frequency of BSE. In this case, remembering is the more important component. Therefore, methods of assisting women to remember should be explored.

Deci's theory of self-determination proved to be a valid source for the prediction of a health behavior, BSE practice. This framework provides a better structure for further examination of BSE performance than has been available before. Also, the relationship of affective response to frequency and competence in BSE performance has not been demonstrated in previous studies. The instrument for measuring affective response has only recently been developed, but proved to be a valuable tool.

While no significant relationship was found between intrinsic motivation and frequency of BSE, instrument deficiencies may have been the cause. Further refinement of the instrument may be needed. The relationship between intrinsic motivation and frequency of BSE has not been satisfactorily investigated.

Cox's (1982) Interaction Model of Client Health Behavior provided the structure for selecting the variables for study. This model clarified the

relationship of the variables and placed the theoretical framework into a health behavior format.

Only the Lauver BSE Scales and the Lashley BSE Techniques Questionnaire demonstrated adequate item analysis and reliability results. The other instruments exhibited problems that could produce measurement error. The lack of valid and reliable instruments has been a continuing problem in determining the reasons for nonperformance of BSE. When the issues with these instruments have been addressed, the ability to diagnose the etiology and provide the specific nursing interventions to increase BSE performance will be enhanced.

Recommendations for Further Study

As a result of the findings of this study, the following recommendations are offered:

1. Future studies should investigate the relationship of the study variables in a more representative sample in order that generalizations can be made.
2. Further development of all the instruments should be conducted; specifically, some items should be clarified and others deleted based on psychometric studies.
3. Further clarification of the concepts underlying the ISSB and the HSDI should be undertaken.

4. Future studies should utilize Deci's theory of self-determination and Cox's model to investigate other health behaviors.

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APPENDIX A

Research Review Committee Exemption Form

Form Approved for Release by NSA on 09-11-2013 pursuant to E.O. 13526

124

This prospectus proposed by: J. Carolyn Banks

Breast Self-Examination: A Test of Deci's

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

X Is exempt from Human Subjects Review Committee review because it is limited to the use of an anonymous questionnaire that will be administered to adults.

_____ Requires Human Subjects Review Committee review
because _____

Chairperson

Member

Member

Member

See:
Rose M. Niesinko
Maison Kasaka
Helen A. Bush
Marion G. Geneva
Katherine L. Allen

APPENDIX B

Permission from Graduate School to Conduct Study

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



June 7, 1989

Ms. J. Carolyn Banks
2740 Fuller wiser
Euless, TX 76039

Dear Ms. Banks:

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

Sincerely yours,

Leslie M Thompson

Leslie M. Thompson
Dean for Graduate Studies
and Research

d1

cc Dr. Rose Nieswiadomy
Dr. Helen Bush

APPENDIX C

Cover Letters and Postcards

Cover Letter for Study

Dear Ms :

As a nurse, I have a special interest in the health of women. This survey will assist in obtaining information about the practice of breast self-examination (BSE).

Your response is important to the understanding of BSE practices. If you are willing to participate by completing this survey, and you are 18 years of age or older, please return the enclosed postcard. Indicate if you would like a summary of the results and an instructional pamphlet on BSE. Then, complete the survey and return it in the enclosed envelope. Instructions are included. Please do not sign your name on the survey to ensure anonymity.

There are no risks involved in participating in this study. Return of the questionnaire within 1 week would be appreciated. Please accept the small gift of appreciation for your time. If you have questions, please contact me at the number below.

Sincerely,

J. Carolyn Banks, R.N., M.S.

(817) 581-0405

Cover Letter for Pilot

Dear Ms :

As a nurse, I have a special interest in the health of women. This survey will assist in obtaining information about the practice of breast self-examination (BSE).

Your response is important to the understanding of BSE practices. If you are willing to participate by completing this survey now and again in 2 weeks, and you are 18 years of age or older, please return the enclosed postcard. Indicate if you would like a summary of the results and an instructional pamphlet on BSE. Then, complete the survey and return it in the enclosed envelope. Instructions are included. Please do not sign your name on the survey to ensure anonymity. I will send another form in 2 weeks. Please write the time required to complete the survey and any problems on the last page of the survey. We will use this information to modify the survey for further use.

There are no risks involved in participating in this study. Return of the questionnaire within 1 week would be appreciated. Please accept the small gift of appreciation for your time. If you have questions, please contact me at the number below.

Sincerely,

J. Carolyn Banks, R.N., M.S.

(817) 581-0405

Postcard

Please complete the following information:

____ I will participate in the study by completing
and returning the questionnaire within 1 week.

____ I would like a copy of the results of the study.

____ I would like an instructional pamphlet on BSE.

The following information will be used only for mailing
the above requests.

Name: _____

Address: _____

City: _____ State _____ Zip Code _____

Reminder Postcard

One week ago you received in the mail a survey on breast self-examination. Your response is very important in obtaining information in the fight against breast cancer. Please take the time to complete and return it. If you have already returned it, thank you for your time. If you need another copy, please call or write:

Carolyn Banks

Breast Cancer Research Project

P. O. Box 429

Colleyville, TX 76034

(817) 581-0405

APPENDIX D
Demographic Data Sheet

RETURN OF THIS QUESTIONNAIRE WILL BE CONSIDERED CONSENT TO
PARTICIPATE IN THIS STUDY.

PART A

Please check the best answer to each question:

1. My age is:

- ☐ 18 to 30 years
- ☐ 31 to 45 years
- ☐ 46 to 60 years
- ☐ 61 to 75 years
- ☐ 76 years or more

2. My marital status is:

- ☐ Never married
- ☐ Married
- ☐ Separated/Divorced
- ☐ Widowed
- ☐ Living with significant other

3. My background is:

- ☐ Black
- ☐ White
- ☐ Hispanic
- ☐ Asian
- ☐ American Indian
- ☐ Other (specify) _____

4. My family income range is:

- ☐ Less than \$10,000 per year
- ☐ \$10,000 to 11,999 per year
- ☐ \$12,000 to 14,999 per year
- ☐ \$15,000 to 24,900 per year
- ☐ \$25,000 to 49,999 per year
- ☐ \$50,000 or more per year

5. I have completed the

- ☐ 1st or 2nd grade
- ☐ 3rd or 4th grade
- ☐ 5th or 6th grade
- ☐ 7th or 8th grade
- ☐ 9th grade
- ☐ 10th grade
- ☐ 11th grade
- ☐ 12th grade
- ☐ 1 year college

6. My religion is:

- ☐ Catholic
- ☐ Jewish
- ☐ Protestant
- ☐ No Preference
- ☐ Other (specify) _____

APPENDIX E

Champion BSE Knowledge Scale
and Permission Letter

PART B

The next questions are about knowledge of breast cancer and breast self-examination. Most people will not know all the answers. Read the questions and then the options. Please check one option in each question.

1. When is the best time during a menstrual cycle to examine the breast?
☐ One week before your period
☐ Two weeks after your period
☐ During your period
☐ One week after your period
☐ Don't know
2. Should a woman check her breasts while in the shower?
☐ No, she might miss lumps
☐ Yes, lumps may be easier to find in the shower
☐ Don't know
3. Are a woman's right and left breasts the same size?
☐ Yes, if the woman is fully developed
☐ No, variation in size is normal
☐ Don't know

4. Should a woman see her doctor if there is a firm ridge in the lower curve of her breast?
☐ Yes ☐ No ☐ Don't know
5. Should a woman see a doctor if she accidentally hits her breast?
☐ Yes ☐ No ☐ Don't know
6. Should a woman see her doctor if she noticed a discharge from her nipple which is not milk?
☐ Yes ☐ No ☐ Don't know
7. Should breast be examined while lying on the side?
☐ Yes ☐ No ☐ Don't know
8. Should breasts be examined twice a month?
☐ Yes ☐ No ☐ Don't know
9. Should breast be examined in a clockwise manner, circling at least three times?
☐ Yes ☐ No ☐ Don't know
10. Should a woman look at her breasts in the mirror with her hands above her head?
☐ Yes ☐ No ☐ Don't know
11. Does early detection of breast cancer improve the chance for recovery?
☐ Yes ☐ No ☐ Don't know

12. Lumps in the breast are one possible sign of breast cancer. Out of every 10 breast lumps that occur, how many do you think would turn out to be cancer?
____ 1-2 ____ 3-4 ____ 5-6 ____ Don't know
13. On the average, how many women will get breast cancer sometime during their life?
____ One woman out of 5 ____ One woman out of 10
____ One woman out of 25 ____ Don't know
14. Is a change in color or texture of skin a sign of breast cancer?
____ Yes ____ No ____ Don't know
15. Who do you think is more likely to get breast cancer?
____ White women ____ Black women
____ No difference ____ Don't know
16. Who do you think is more likely to get breast cancer?
____ Women over 35 ____ Women under 35
____ No difference ____ Don't know

17. Who do you think is more likely to get breast cancer?

☐ Women who have 1st child before 20 are more likely

☐ Women who have 1st child after 20 are more likely

☐ No difference

☐ Don't know

18. Who do you think is more likely to get breast cancer?

☐ Women whose mothers and sisters have had breast cancer

☐ Women whose mothers and sisters have not had breast cancer

☐ No difference

☐ Don't know

19. Bumping or bruising the breast can cause breast cancer.

☐ Yes ☐ No ☐ Don't know

20. Fondling or caressing the breast can cause breast cancer.

☐ Yes ☐ No ☐ Don't know

21. What is a mastectomy?

☐ A test ☐ A treatment ☐ Don't know

22. What is a biopsy?

___ A test ___ A treatment ___ Don't know

23. Can plastic surgery ever be done to replace or reconstruct a breast that has been surgically removed?

___ Yes, sometimes ___ No, never ___ Don't know

24. What is a mammogram?

___ An x-ray of the breast

___ A chemical test for cancer

___ A kind of radiation therapy for breast cancer

___ Don't know

25. Who is most likely to find lumps in the breasts?

___ The woman herself

___ A nurse

___ A physician

___ Others persons, such as husband

PART C

We would now like you to tell us about your breast self-examination.

Please check one option for each question.

1. Have you ever examined your breasts for lumps which might be breast cancer?
☐ Yes ☐ No, GO TO PART E
2. How many years ago did you first examine your breasts?
☐ Years ago
3. During the past year did you examine your breasts for breast cancer.
☐ Yes ☐ No
4. In the past year, did you examine your breasts monthly for breast cancer?
☐ Yes ☐ No

5. During the past year, how often did you examine your breasts?

- ☐ Not at all
- ☐ 1 or 2 times a year
- ☐ About 3 times a year
- ☐ About 4 times a year
- ☐ About once every other month
- ☐ About once a month
- ☐ Twice a month or more often

6. During the past three months, how often did you examine your breasts? Did you examine your breasts:

- ☐ Not at all
- ☐ 1 time during the past 3 months
- ☐ 2 times during the past 3 months
- ☐ 3 times during the past 3 months
- ☐ 4 or more times during the past 3 months



INDIANA UNIVERSITY

610 Barnhill Drive
Indianapolis, Indiana 46223

SCHOOL OF NURSING

May 19, 1988

Carolyn Banks, R.N., M.S.
6100 Hunter Lane
Colleyville, TX 76034

Dear Ms. Banks,

I am enclosing a copy of the instrument used to measure knowledge and frequency from my latest research project. I am also including a copy of the article which gives some information on validity and reliability of these two measures. You have my permission to use these as long as you cite my work and send me a copy of your results. Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Victoria Champion".

Victoria Champion, R.N., D.N.S.
Associate Professor

VC:dg

Enclosure

APPENDIX F

Lashley BSE Techniques Questionnaire
and Permission Letter

PART D

Please check whether or not you carry out each step listed below everytime you examine your breasts.

1. I examine my breasts during my bath or shower.

_____ Yes _____ No

2. I look at my breasts in the mirror with my arms at my sides.

_____ Yes _____ No

3. I look at my breasts in the mirror with my arms raised over my head.

_____ Yes _____ No

4. I look at my breasts in the mirror with my hands on my hips.

_____ Yes _____ No

5. When I look at my breasts in the mirror, I am looking for swelling, dimpling of the skin, or changes in the nipple.

_____ Yes _____ No

6. I examine my breasts while lying down.

_____ Yes _____ No

7. When lying down, I place a towel or pillow under my shoulder before examining my breast on that side.
_____ Yes _____ No
8. When lying down, I place my hand above my head before examining my breast on that side.
_____ Yes _____ No
9. I use my right hand to examine my left breast and my left hand to examine my right breast.
_____ Yes _____ No
10. I examine one breast at a time.
_____ Yes _____ No
11. I examine my breasts in a circular or clockwise motion moving from the outside in.
_____ Yes _____ No
12. When examining my breasts, I feel for lumps, hard knots, or thickening.
_____ Yes _____ No
13. When examining my breasts, I also feel my armpit area.
_____ Yes _____ No
14. I squeeze the nipple of each breast to look for discharge.
_____ Yes _____ No

TOWSON STATE UNIVERSITY

TOWSON, MARYLAND 21204

COLLEGE OF ALLIED HEALTH SCIENCES AND PHYSICAL EDUCATION

Department of Nursing

April 12, 1988

(301) 321-2067

Carolyn Banks, RN, MS
6100 Hunter Lane
Colleyville, Texas 76034

Dear Ms. Banks:

Thank you for your interest in my article entitled "Predictors of Breast Self-Examination Practice Among Elderly Women", which appeared in the July, 1987 issue of Advances in Nursing Science. In response to your letter, I am enclosing a copy of my research tool along with information regarding the reliability and validity of the study instrument. I am also enclosing a reference list for your information.

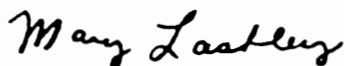
You certainly have my permission to use my research instrument for your study. Please note, however, that certain sections of the tool have been modified or obtained from other sources. The first section of my questionnaire comes from the work of Dr. Victoria Champion. Dr. Champion may be contacted at

School of Nursing
Indiana University
610 Barnhill Drive
Indianapolis, Indiana 46223

The only additional request I have in using my research is that you cite my work.

If I can be of any further assistance to you, please do not hesitate to contact me. I would be very interested in any information you could give me about your study upon completion of your work.

Sincerely,



Mary Lashley, RN, MS,
ANP-C, GNP-C, CEN
Assistant Professor

APPENDIX G

Lauver BSE Scales and
Permission Letter

PART E

The following statements are about health and health-related issues. Please circle one number to indicate how much you disagree or agree with each statement.

	Strongly		Neither Agree		Strongly
	<u>Agree</u>		<u>Agree or Disagree</u>		<u>Disagree Disagree</u>
1. I am comfortable looking at my breasts in great detail.	5	4	3	2	1
2. I find it easy to remember to do BSE.	5	4	3	2	1
3. It is embarrassing for me to do BSE.	5	4	3	2	1
4. I find it easy to remember BSE.	5	4	3	2	1
5. When I think about BSE, it's not the recommended time of the month, so I don't do it.	5	4	3	2	1

	Strongly		Neither Agree		Strongly
	<u>Agree</u>		<u>Agree or Disagree</u>		<u>Disagree Disagree</u>
6. I have my own way of reminding myself to do BSE.	5	4	3	2	1
7. I find it difficult to remember BSE at the recommended time.	5	4	3	2	1
8. I am comfortable with touching my breasts.	5	4	3	2	1
9. It is embarrassing for me to look at my breasts.	5	4	3	2	1
10. I am comfortable with the thought of doing BSE.	5	4	3	2	1
11. I don't think I should touch my breasts.	5	4	3	2	1

		Strongly		Neither Agree		Strongly	
		<u>Agree</u>		<u>Agree or Disagree</u>		<u>Disagree</u> <u>Disagree</u>	
12.	I am comfortable	5		4	3	2	1
	looking at my						
	breasts.						
13.	It is embarrassing	5		4	3	2	1
	for me to do BSE.						

UNIVERSITY of PENNSYLVANIA

School of Nursing
Nursing Education Building
Philadelphia, PA 19104-6096
215-898-8281

February 20, 1989

J. Carolyn Banks
6100 Hunter Lane
Colleyville, Texas 76034

Dear Ms. Banks:

Thank you for your interest in our publication, "Development of a questionnaire to measure beliefs and attitudes about breast self-examination." I am glad for continued interest in BSE and specifically in specifying barriers to BSE. If you choose to pursue research on BSE, you are certainly welcome to incorporate our items. I would ask that you please cite us as the source of the items used and share your findings with us.

As stated in the article, we recognized that some of the items were confounded with the outcome measure, performance of BSE. Thus, we chose not to use items that reflected some dimension of performance of BSE when testing the association between selected items and performance; to do so would yield inflated relationships. To clarify, these items were: #30, 32, 34, & 36.

Also, two items were deleted from the remembering scale because they were confounded with performance (#30, 32). Deleting the one item about being reminded to do BSE by things seen and heard (#3) greatly improved the internal consistency of the scale.

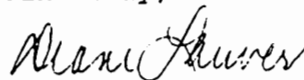
In order that higher scale scores indicate a greater degree of agreement with the construct of interest, the following items can be reverse scored: 2, 9, 10, 18, 19, 21, 23, 24, 26, 28, 30, 32, 33, 35, 42, 46, 48, 50. You will also note that some of these items tap the opposite end of a given construct. For example, the items that were originally designed to tap embarrassment were found, not to our surprise, to be internally consistent with the scale we later called comfort.

I would like to call your attention to a typographical error, so that you do not become unnecessarily confused. In the article, Table 2 should read that the specific efficacy scale was comprised of 6 items, not 5. Thus, no item listed for the specific efficacy scale in Table 1 was deleted.

Regarding reliability and validity of the scales, please refer to the article that describes that Cronbach alphas were calculated for internal consistency, one measure of reliability, using SPSS programs. Content validity and criterion validity are both discussed in the article as well.

I hope these clarifications facilitate the development of your research. Please feel free to call me should you have further questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Diane Lauver".

Diane Lauver, Ph.D., R.N.C.
Robert Wood Johnson
Clinical Nurse Scholar

APPENDIX H

Inventory of Social Supportive Behaviors

PART F

We are interested in learning about some of the ways that you feel people have helped you or tried to make life more pleasant for you over the past four weeks. Below you will find a list of activities that other people might have done for you, to you, or with you in recent weeks. Please read each item carefully and indicate how often these activities happened to you during the past four weeks.

1. Someone looked after a family member when you were away.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

2. Someone was right there with you (physically) in a stressful situation.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

3. Someone provided you with a place where you could get away for awhile.
- ☐ Not at all
 - ☐ Once or twice
 - ☐ About once a week
 - ☐ Several times a week
 - ☐ About every day
4. Someone watched after your possessions when you were away (pets, plants, home, apartment, etc.).
- ☐ Not at all
 - ☐ Once or twice
 - ☐ About once a week
 - ☐ Several times a week
 - ☐ About every day
5. Someone told you what she/he did in a situation that was similar to yours.
- ☐ Not at all
 - ☐ Once or twice
 - ☐ About once a week
 - ☐ Several times a week
 - ☐ About every day

6. Someone did some activity with you to help you get your mind off of things.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

7. Someone talked with you about some interests of yours.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

8. Someone let you know that you did something well.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

9. Someone went with you to someone who could take action.
- ☐ Not at all
 - ☐ Once or twice
 - ☐ About once a week
 - ☐ Several times a week
 - ☐ About every day
10. Someone told you that you are O.K. just the way you are.
- ☐ Not at all
 - ☐ Once or twice
 - ☐ About once a week
 - ☐ Several times a week
 - ☐ About every day
11. Someone told you that she/he would keep the things that you talk about private--just between the two of you.
- ☐ Not at all
 - ☐ Once or twice
 - ☐ About once a week
 - ☐ Several times a week
 - ☐ About every day

12. Someone assisted you in setting a goal for yourself.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

13. Someone made it clear what was expected of you.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

14. Someone expressed esteem or respect for a competency or personal quality of yours.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

15. Someone gave you some information on how to do something.

☐ Not at all
☐ Once or twice
☐ About once a week
☐ Several times a week
☐ About every day

16. Someone suggested some action that you should take.

☐ Not at all
☐ Once or twice
☐ About once a week
☐ Several times a week
☐ About every day

17. Someone gave you over \$25.00.

☐ Not at all
☐ Once or twice
☐ About once a week
☐ Several times a week
☐ About every day

18. Someone comforted you by showing you some physical affection.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

19. Someone gave you some information to help you understand a situation you were in.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

20. Someone provided you with some transportation.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

21. Someone checked back with you to see if you followed the advice you were given.

☐ Not at all
☐ Once or twice
☐ About once a week
☐ Several times a week
☐ About every day

22. Someone gave you under \$25.00.

☐ Not at all
☐ Once or twice
☐ About once a week
☐ Several times a week
☐ About every day

23. Someone helped you understand why you didn't do something well.

☐ Not at all
☐ Once or twice
☐ About once a week
☐ Several times a week
☐ About every day

24. Someone listened to you talk about your private feelings.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

25. Someone loaned or gave you something (a physical object other than money) that you needed.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

26. Someone agreed that what you wanted to do was right.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

27. Someone said things that made your situation clearer and easier to understand.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

28. Someone told you how he/she felt in a situation that was similar to yours.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

29. Someone let you know that he/she will always be around if you need assistance.

___ Not at all
___ Once or twice
___ About once a week
___ Several times a week
___ About every day

30. Someone expressed interest and concern in your well-being.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

31. Someone told you that she/he feels very close to you.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

32. Someone told you who you should see for assistance.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

33. Someone told you what to expect in a situation that was about to happen.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

34. Someone loaned you over \$25.00.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

35. Someone taught you how to do something.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

36. Someone gave you feedback on how you were doing without saying it was good or bad.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

37. Someone joked and kidded to try to cheer you up.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

38. Someone provided you with a place to stay.

- ☐ Not at all
- ☐ Once or twice
- ☐ About once a week
- ☐ Several times a week
- ☐ About every day

39. Someone pitched in to help you do something that needed to get done.

___ Not at all

___ Once or twice

___ About once a week

___ Several times a week

___ About every day

40. Someone loaned you under \$25.00.

___ Not at all

___ Once or twice

___ About once a week

___ Several times a week

___ About every day

APPENDIX I

Health Self-Determinism Index
and Permission Letter

PART G

The following statements are about health and health-related issues.
Please circle one number to indicate how much you disagree or agree
with each statement.

- | | Strongly | | | | | Strongly |
|---|--------------|--------------|------------------|-----------------|-----------------|----------|
| | <u>Agree</u> | <u>Agree</u> | <u>Undecided</u> | <u>Disagree</u> | <u>Disagree</u> | |
| 1. For me, it takes more
willpower than I have
to do the things that
I know are good for
my health. | 1 | 2 | 3 | 4 | 5 | |
| 2. Most of the time I
know what to do for
my health without
needing to contact
a doctor. | 1 | 2 | 3 | 4 | 5 | |
| 3. Only a doctor really
knows whether or not
I am in good health. | 1 | 2 | 3 | 4 | 5 | |

- | | Strongly | | | | Strongly |
|--|--------------|--------------|------------------|-----------------|-----------------|
| | <u>Agree</u> | <u>Agree</u> | <u>Undecided</u> | <u>Disagree</u> | <u>Disagree</u> |
| 4. Some people think
that a doctor should
decide about what to
do about their health
care, but I feel that
I should decide. | 1 | 2 | 3 | 4 | 5 |
| 5. I worry about my
health. | 1 | 2 | 3 | 4 | 5 |
| 6. Whatever a doctor
suggests about my
health is OK for
me to do. | 1 | 2 | 3 | 4 | 5 |
| 7. I know, without someone
else telling me, when
I am in good health. | 1 | 2 | 3 | 4 | 5 |

Strongly

Strongly

Agree Agree Undecided Disagree Disagree

8. I more often agree
with what doctors and
nurses think instead
of my own opinion. 1 2 3 4 5
9. I feel good about
how I take care of
my health. 1 2 3 4 5
10. I do things to help
my health even though
a doctor or nurse has
not suggested these
things to me. 1 2 3 4 5
11. I'm really never sure
that I'm doing the
right things for my
health until I've
checked it out with
a doctor. 1 2 3 4 5

	Strongly				Strongly
	<u>Agree</u>	<u>Agree</u>	<u>Undecided</u>	<u>Disagree</u>	<u>Disagree</u>
12. My own ideas about taking care of my health are often better than the ideas which doctors and nurses have.	1	2	3	4	5
13. I don't do as well at taking care of my health as other people I know.	1	2	3	4	5
14. I prefer that doctors and nurses help me plan my health practices.	1	2	3	4	5
15. I know, without a doctor telling me, that I'm doing the right thing for my health.	1	2	3	4	5

Strongly

Strongly

AgreeAgreeUndecidedDisagreeDisagree

16. What a doctor thinks

about my health is

more important than

what I think.

1

2

3

4

5

17. I know what I'm doing

when it comes to

taking care of my

health.

1

2

3

4

5

THE
UNIVERSITY
OF
ILLINOIS
AT
CHICAGO

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College of Nursing
Department of Public Health Nursing
845 South Damen Avenue
Box 6998, Chicago, Illinois 60680
(312) 996-0063
April 18, 1988

Carolyn (Gonzalez) Banks, R.N., M.S.
6100 Hunter Lane
Colleyville, TX 76034

Dear Ms. Banks:

Thank you for your interest in the HSDI. Additional work has been done on the instrument -- 6 more reliability evaluations have been completed resulting in Total HSDI alphas of .80, .87, .84, .85, .80, and .78. The latter reliability estimation is based on a sample of 378 elders; the decreased alpha is attributed to the homogeneity of the sample and thereby a decreased response variance. An article which appeared in the December, 1985 issue of Public Health Nursing (2, 202-212) describes the studies relative to the .80 and .87 alphas. The latter alphas are reported in an article appearing in the July issue of ANS. A two week test-retest was completed yielding a stability coefficient of .86.

A student has recently completed a masters thesis which examined the predictive validity of the HSDI relative to positive health behaviors (nutrition, sleep, exercise, smoking, alcohol intake, etc.). Despite the small sample size ($N = 55$), the competency subscale was a significant predictor of the number of self-reported positive health behaviors practiced by respondents. The demographic variables in this study were consistent with a previous study (Public Health Nursing) in their ability to predict the HSDI and its subscales.

Again, thank you for your interest, and the very best to you and your colleagues in your research endeavor.

Sincerely,

Cheryl L. Cox
Cheryl L. Cox, Ph.D., R.N., C.
Associate Professor
Public Health Nursing

Enclosure

CLC/kas

APPENDIX J
Combined Instruments

Information about this instrument may be obtained from:

Carolyn Banks

6100 Hunter Lane

Colleyville, Texas 76034