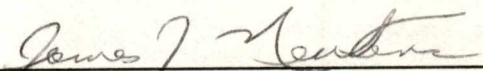
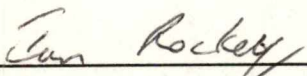
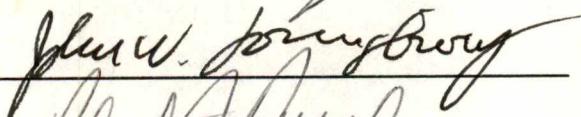
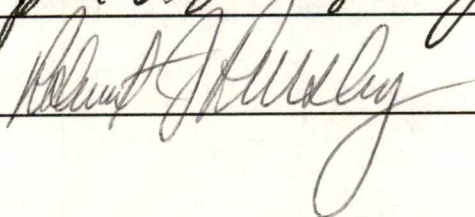


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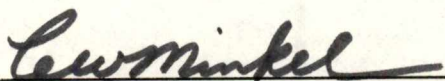
I am submitting herewith a dissertation written by Catherine E. Crooks entitled "The Prediction and Verification of a Woman's Intention to Participate in a Mammography Screening Program." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.


James J. Neutens
Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:


Vice Provost and
Dean of The Graduate School

THE PREDICTION AND VERIFICATION OF A WOMAN'S INTENTION
TO PARTICIPATE IN A MAMMOGRAPHY SCREENING PROGRAM

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Catherine E. Crooks

May 1990

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DEDICATION

In memory of my father, John Crooks, with love

ACKNOWLEDGMENTS

I would first like to thank my committee chairperson, Dr. Jim Neutens, for his support, patience and encouragement throughout the program. His friendship will always be cherished. I would also like to thank my other committee members, Dr. John Lounsbury, Dr. Jack Pursley, and Dr. Ian Rockett for their unique contributions and support with this research.

I am indebted to Mr. C. E. Bilbrey, Associate Vice Chancellor of Marketing and Sue Patterson, Director of Marketing Services at the University of Tennessee Medical Center at Knoxville for their financial assistance as well as their interest in this project. I would also like to thank Myrna Sayne, Radiology Department at UT Medical Center, for her assistance with the project.

In addition, my appreciation is expressed to Susan Dominick, Andra Kribs, and Claire Newell, whose time and patience in recruiting subjects was invaluable.

Many thanks is offered to Kurt Weiss for his assistance with the design and development of the final instrument and for his friendship over the past two years.

There are numerous individuals in the department of Health, Leisure and Safety whose friendship and support meant so much over the past three years. Special thanks to my fellow doctoral students and GTA's in the department who each touched my life in their own unique ways.

I would also like to thank Dr. Nancy Davis and Dr. Richard Driscoll for their help and encouragement, particularly during the last phases of this research.

Deep gratitude and love is extended to my grandmother, Gertrude Heileman, my mother, Virginia Crooks, and my late father, John Crooks, for the many sacrifices they made during the course of my education. Without their help, I would not have been able to continue my graduate education. I am so thankful that my father was able to share at least the beginning stages of my doctoral studies with me.

Lastly, I would like to thank my fiancé and best friend, Steve Jones. He was the first to encourage me to pursue my doctorate and he stood by me through all of the rough times when I wanted to give up. His total love, support, and encouragement over the past four years helped give me the strength to attain my goal. He believed in me from the beginning.

ABSTRACT

The purpose of the study was to identify and verify factors that determine a woman's intention to participate in a mammography screening program. Ajzen and Fishbein's theory of reasoned action was used as the theoretical framework for analyzing attitudes, subjective norms and intentions related to obtaining a mammogram while the Mobile Medical Unit van was on campus in November 1989.

An instrument designed to measure attitudes, subjective norms and intentions was developed following the protocol suggested by Ajzen and Fishbein. The instrument was subsequently evaluated for internal consistency using Cronbach's alpha.

The sample consisted of 199 women ages 40 and older from the University of Tennessee, Knoxville. Multiple regression analysis was used to predict intention to obtain a mammogram on the Mobile Medical Unit van and to test the theory of reasoned action.

The major findings of the study were: (1) With regard to intention to obtain a mammogram when the Mobile Medical Unit van was on campus, neither attitude nor subjective norm significantly predicted intention to obtain a mammogram; (2) With regard to intention to obtain a mammogram within the next two years, both attitude and subjective norm

together in the equation significantly predicted intention and accounted for 27 percent of the variance. Attitude alone was a significant predictor of intention over and above subjective norm; (3) Thirty-eight of 198 respondents reported that they intended to obtain a mammogram while the Mobile Medical van was on campus. The percentage of intend-ers who actually obtained a mammogram on the van was 29.7 percent.

Based upon the findings of the study, the following major conclusions were reached: (1) With regard to the Mobile Medical Unit van, the theory of reasoned action failed to predict a woman's intention to obtain a mammogram; (2) With regard to intention to obtain a mammogram within the next two years, the attitudinal component of the model played a larger role than subjective norm in predicting intention.

The results of the data analyses will be used to develop guidelines for future marketing and health promotion strategies aimed at encouraging women to participate in breast screening activities.

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CHAPTER 1

INTRODUCTION

Breast cancer, one of the leading causes of cancer deaths among women, is a major health concern in the United States. According to the National Cancer Institute (1987), the incidence rate of breast cancer cases for all ages in the white female population in 1985 was 104.2 per 100,000 and there were 27.6 deaths per 100,000 that year.

One way of decreasing the incidence of mortality from breast cancer is by early detection through mammographic screenings and breast physical examinations by a health professional. Many screening programs also teach women to perform breast self-examination (BSE) (Greenwald et al., 1978; Shapiro, 1977; Shapiro, Strax & Venet, 1972). Early detection and treatment is especially important in breast cancer since the five-year survival rate for localized breast cancer is 90 percent. For cases with regional disease (disease spread to adjacent organs or structures), the survival rate declines to 69 percent (NCI, 1987).

In view of these statistics, considerable emphasis has been placed on screening programs using mammography and breast physical examination to detect breast cancer early, and thus improve its prognosis. According to the National

Cancer Institute (1984), mammography is considered to be the most accurate of all early detection techniques. It can detect lumps in the breast that are too small to be felt even by the most experienced health professional (NCI, 1984).

The most convincing evidence that screening for breast cancer is effective in reducing mortality comes from the Health Insurance Plan of Greater New York Study (HIP Study). In this study, 31,000 women over the age of fifty received annual physical examinations and mammograms for four years. A one-third reduction in mortality was observed through 10 years of follow-up (Shapiro, 1977).

Although the benefits of early detection and treatment by mammography is rarely disputed, the problem of obtaining false-negative and false-positive diagnostic results should not be ignored. Mammography is less accurate in dense breasts because developing cancer may be more easily masked in dense breast tissue which increases the chances of obtaining false-negative test results (Peeters, Verbeek, Hendriks, Holland, & Mravunac, 1987; Wolfe, Buck, Salane, & Parekh, 1987). Numerous studies have shown that the sensitivity and predictive value of mammography tends to increase with age (Moskowitz, 1988; Peeters, Verbeek, Hendriks, Holland, & Mravunac, 1987 Wolfe et al., 1987). Conversely, benign breast patterns may radiographically appear to be

like carcinomas, which may lead to false-positive diagnoses (Wolfe et al., 1987).

While the efficacy of mammography and breast physical examination has been well documented, these screening techniques are underutilized. According to a 1983 Gallup Survey, only about 15 percent of American women over age 50 are receiving recommended annual screening mammograms (Gallup, 1984). Major inhibitors related to the use of mammography and the attainment of breast physical examination include fear of the procedure(s), fear that cancer will be diagnosed, fear of radiation exposure, and financial costs.

Promotional efforts to increase public awareness about the importance of mammography and breast physical examination are currently being sponsored by the American Cancer Society in some states. These programs include public and professional educational programs, quality control for mammography equipment, and subsidized mammography (Howard, 1987). Results from the Mammography Screening Pilot Project in Illinois (launched in 1982 by the Illinois Division of the American Cancer Society) demonstrated that public education and a reduction in mammography costs substantially increased the number of women who received mammograms (Winchester, Lasky, Sylvester & Maher, 1988).

Need for the Study

In its early stages, breast cancer produces no clinical symptoms. One of the ways to reduce mortality from this disease is by early detection through mammographic screenings. Although most women are aware of this screening technique, only 15 percent of women over age 50 are obtaining recommended annual mammograms (Gallup, 1984).

In an effort to understand why women fail to comply with recommendations for breast screenings, various studies have been conducted to determine the attitudes, knowledge and beliefs related to participation or nonparticipation in breast screening activities. Several of these studies have employed Ajzen and Fishbein's theory of reasoned action to predict intention to perform breast self-examination (Horne, McDermott, & Gold, 1986; Calnan & Moss, 1984; Sullivan & Joyce, 1981). To date, however, no studies have used the theory of reasoned action to predict women's intentions to obtain a mammogram. Moreover, verification of intention through behavior follow-up has not been done in any of the studies related to the early detection of breast cancer. In addition to simply testing the model provided by the theory of reasoned action to predict intention, the model can serve as a theoretical framework to assess various attitudes and beliefs related to participation or

nonparticipation in breast screening activities. Identification of attitudes and beliefs that are significant predictors of intentions to obtain a mammogram and breast physical examination may serve as a guide in developing health promotion and marketing strategies aimed at encouraging women to participate in breast screening activities.

Statement of the Problem

Using Ajzen and Fishbein's theory of reasoned action, the problem of this study was to identify and verify factors that determine a woman's intention to participate in a mammography screening program.

Research Questions

For purposes of this investigation, the following research questions were formulated:

1. What are the positive and negative consequences that women believe will occur as a result of participating in a mammography screening program?
2. What people or groups of people influence a woman's decision to participate or not participate in a mammography screening program?

3. Which component(s) of the model will significantly predict a woman's intention to participate in a mammography screening program?
4. What percentage of intenders participated in a mammography screening program in November 1989?
5. What are the differences between questionnaire respondents and nonrespondents?
6. What recommendations for health promotion and marketing can accrue from identifying significant factors related to participation in a mammography screening program?

Basic Assumptions

The basic assumptions in this investigation were:

1. The individuals who participated in the study responded honestly to the questionnaire.
2. Attitudes are relatively stable over a period of time.

Delimitations

The major delimitations of this study were:

1. The population was restricted to female faculty and staff ages 40 and older at the University of Tennessee, Knoxville.
2. The study focused on attitudes, beliefs and intentions related to mammography only (not breast physical examination or breast self-examination).

Limitations

The major limitations of this study were:

1. Results of this study may be generalizable only to other similar populations.
2. Only those subjects who volunteered to participate were included in the study.

Definitions

Ajzen and Fishbein's theory of reasoned action. A theoretical framework designed to predict the intention to perform a particular behavior in a given situation.

Attitude. A general feeling of favorableness or unfavorableness towards any concept (Ajzen and Fishbein, 1980).

Breast physical examination. A manual examination of the breast usually performed by a physician or trained

health professional. This is usually done in conjunction with a mammogram.

Breast screening. Techniques used for the early detection of breast cancer. It always includes a mammogram and usually includes a breast physical examination. Some screening programs also teach women how to perform breast self-examination.

Incidence rate. The number of new cancer cases occurring in a specified population during a year and expressed as number of cases per 100,000 of that population (NCI, 1987).

Intention. A person's subjective probability that he/she will perform some behavior (Ajzen and Fishbein, 1980).

Localized disease. Disease confined to the site of origin (NCI, 1987).

Mammography. An x-ray technique that visualizes the internal structure of the breast.

Positive predictive value. The probability that a person with a positive screening test is a true positive (Last, 1988).

Rad (radiation absorbed dose). The basic unit of radiation dose. One rad is equal to 100 ergs of energy absorbed per gram of tissue.

Regional disease. Disease spread to adjacent organs or structures or to regional lymph nodes (NCI, 1987).

Sensitivity. The proportion of truly diseased persons in the screened population who are identified as diseased by the screening test (Last, 1988).

Specificity. The proportion of truly nondiseased persons in the screened population who are identified as non-diseased by the screening test (Last, 1988).

Subjective norm. An individual's overall belief regarding the degree to which important others feel that he/she should or should not perform a specific behavior (Ajzen and Fishbein, 1980).

Survival rate. The length of time that a person lives after the cancer has been diagnosed (usually expressed in five- or ten-year intervals).

Verify. To confirm or substantiate intention to participate in a mammography screening program.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This review of the literature encompasses the following topics: efficacy of mammography and breast physical examination, factors influencing participation in breast screenings, models used to explore attitudes and beliefs about breast cancer detection, health promotion strategies, and summary.

Efficacy of Mammography and Breast
Physical Examination

It has been well established that one way of decreasing the incidence of morbidity and mortality from breast cancer is through early detection and screening (Baker, 1982; Billings, 1986; Greenwald et al., 1978; Hoehn, Hardacre, Swanson, Williams, & Kuehner, 1986; Shapiro, 1977; Shapiro, Strax, & Venet, 1972). Mortality is strongly related to the stage at when the disease was detected (Axtell, Ashire, & Meyers, 1976). According to the National Cancer Institute (1987) the five-year survival rate is 90 percent for patients with local disease and 69 percent for those with regional disease.

Early detection of breast cancer through mammographic screenings and breast physical examinations have been shown to reduce mortality rates in women over the age of fifty. The evidence for this was primarily derived from the Health Insurance Plan (HIP) of Greater New York trial, a randomized, controlled study in which 31,000 women were given annual physical and mammographic exams for four years. A one-third reduction in breast cancer mortality was observed through 10 years of follow-up (Shapiro, 1977). More recent follow-up data from the HIP study indicates that women in the 40-49 age group also benefit from mammographic screenings. It should be noted that in the follow-up period, case comparability was achieved by examining breast cancer cases at the point at which the number of breast cancer cases detected in the control group "caught up" with the number of cases detected in the study group. Allowing for lead-time bias ensured that the cases detected in both groups were comparable, which results in an unbiased analysis (Chu, Smart, & Tarone, 1988). In 742 patients who were followed up for 18 years after the trial entry, 24 percent fewer breast cancer deaths were found among women who were screened in the 40-49 age group than those in the non-screened control group. For women in the 50-64 age group, there were 21 percent fewer deaths reported in the 18 year follow-up (Chu, Smart, & Tarone, 1988). Although the

mortality reductions were similar between groups, it took a shorter time to demonstrate a significant reduction in the 50 and older age group (Chu, Smart, & Tarone, 1988).

Mammography is an X-ray technique that is considered to be the most accurate of all early detection techniques (National Cancer Institute, 1984). It has been shown that early diagnosis from mammographic screenings alone will reduce breast cancer mortality (Baker, 1982; Chu, Smart, & Tarone, 1988).

Further evidence that mammography is beneficial in the early detection of cancer comes from the Breast Cancer Detection Demonstration Project (BCDDP). This project was jointly funded by the American Cancer Society and the National Cancer Institute and was operational at 27 locations throughout the U.S. (Baker, 1982). In this study, 280,000 women were screened with mammography and breast physical examination at yearly intervals for five years. Recent analyses of the BCDDP data by the National Cancer Institute showed that 91 percent of cancers among women in the 40-49 age group and 92 percent of cancers among women in the 50-59 age group were detected by mammography alone (Chu, Smart, & Tarone, 1988). Follow-up results from the BCDDP revealed that the ten-year survival rates for mammography combined with breast physical examination was 77 percent (Seidman, Gelb, Silverberg, LaVerda, & Lubera, 1987). The

BCDDP data should be interpreted with caution, however, because the BCDDP was a demonstration project rather than a randomized, controlled trial.

First results from the Nijmegen Project, a population-based screening program in The Netherlands, indicates that breast cancer mortality for women over age 35 can be reduced by 50 percent through regular mammographic screenings (Verbeek, Holland, Sturmans, Hendriks, Mravunac & Day, 1984). In this trial, all women in the city of Nijmegen (population of 150,000) born between the years 1910-1939 were invited to participate in a mammography screening program. Four screening rounds were carried out between 1975 and 1982. The attendance rates in all age groups fell from 84.8 percent in the first screening round (1975-1976) to 52.5 percent in the fourth (1981-1982). Data from this study are still preliminary, and results of the effects of mammography in the younger age groups are not yet available. In addition, this trial is a case-control design rather than a randomized study, and it is possible that various sources of bias have not yet been considered.

In the UK, 236,594 women aged 45-64 were enrolled in the UK Trial of Early Detection of Breast Cancer program in 1979. This multi-center trial offered mammography and clinical examination to 45,841 women in two locations and breast self-examination educational programs in two other locations

was offered to 63,636 women. A control population of 127,117 women were used as a comparison group. Over a seven-year period, a 20 percent reduction in mortality was observed in the mammography screening group (Chamberlain, Coleman, Ellman & Moss, 1988). However, these reductions were not statistically significant in the first 6-7 years of the trial. Data from this trial is preliminary, and the authors suggest that long-term follow-up is needed in order to fully evaluate all aspects of the screening program (Chamberlain et al., 1988).

While it has been demonstrated that mammography is beneficial in the early detection of breast cancer, controversy remains over what the acceptable sensitivity, specificity and predictive values for screening mammography should be. It is generally agreed that the sensitivity of mammography increases with age (Hicks et al., 1979; Peeters et al., 1987; Wolfe et al., 1987). In a review of various screening programs, Baines et al. (1986) reported that the sensitivity levels of mammography ranged from 29 percent to 95 percent and the specificity levels ranged from 51 percent to 98 percent. The data that Baines et al. reported were from 1979 to 1984. There did not appear to be any distinct pattern with relation to specificity, sensitivity, and the year the data were reported. However, comparing data from different screening programs is difficult since there is

variation in equipment, in training, in experience and knowledge of technicians and radiologists, in the viewing techniques, and in screening tests used (Baines et al., 1986; Peeters et al., 1987). In addition, the sensitivity and specificity of mammography will vary among populations being examined. For example, in a population of women who are clinically asymptomatic, the sensitivity of mammography is likely to be much lower than in a population of symptomatic women (Cole & Morrison, 1980).

Small cancers that may not be detectable by a physical examination are sometimes difficult to detect by mammography, especially in younger women where the breast tissue is dense (Peeters et al, 1987; Wolfe et al., 1987). This may lead to an increased rate of false-negative test results. Factors such as inadequate positioning and reading of the mammograms, fast-growing tumors that are not detected at annual screening intervals and cancers that are not detectable by mammography due to their location may also lead to false-negative test results (Hendriks & Verbeek, 1985). Conversely, false-positive test results may occur because of benign breast diseases that may appear radiographically like a cancer.

Although the efficacy of these screening techniques has been well documented, they are underutilized. It is estimated that only 45 percent of women aged 50 and older

are obtaining breast physical exams, and only 15 percent are obtaining recommended annual mammograms (Gallup, 1984; Maibach, Gigliotti, & Block, 1986).

In the past, there has been some concern expressed over the risk of radiation-induced breast cancer. However, current improved technology and the use of xeromammography have significantly lowered radiation doses (Pope, 1983). During the past few years, considerable emphasis has been placed on reducing radiation exposure. For a two-view examination, radiation exposure is less than 1 rad per breast. With xeromammography exposure is approximately .74 rad (Hammerstein et al., 1979). With the advent of modern technology, the potential benefits of mammography in the early detection of cancer outweighs the relative risk of the procedure.

Factors Influencing Participation in Breast Screenings

A considerable amount of research has been done on factors that distinguish participants and nonparticipants in breast screening programs. The research can be broken down into three general areas: (1) factors that distinguish between participants and nonparticipants in breast screening programs, (2) retrospective explanations for nonparticipation in breast screening programs, and (3) women's knowledge and attitudes towards breast screening activities, including

fears related to breast cancer and breast cancer screenings. Each of these areas will be reviewed subsequently.

Calnan (1985) conducted a study to identify factors that may distinguish between participants and nonparticipants in various forms of preventive health behaviors. A step-wise discriminant analysis was performed to select the independent variables that discriminate between groups. Results of the analysis indicated that the best discriminating variables for distinguishing between the practice or nonpractice of breast screening activities were social class (determined by occupation of head of household and Registrar General's classification), age, friends, control over health, education, employment status, and consultation behavior (i.e., at least one visit per year to their general practitioner).

Calnan, Moss and Chamberlain (1985) designed a study to analyze social, psychological and demographic factors associated with attendance or nonattendance at a clinic that provided mammography and breast physical examination. A random sample of 854 women were interviewed in their own homes one month prior to receiving an invitation to attend a breast screening clinic. Six hundred fifty-four of the 854 women were successfully interviewed and 72 percent of these women subsequently attended the clinic. The authors suggest that the interview may have prompted women to attend the breast screening clinic. Results indicated that attenders

were more likely than nonattenders to see breast screening as beneficial, to feel vulnerable to breast cancer, and to view it as a serious disease. Results also revealed that there was no variation in attendance by social class or educational background, although attenders were more likely to be married than nonattenders. Women who reported having at least one close confiding relationship were more likely to attend than those who said they had no close friends.

Van Den Heuvel (1978) found that people have a negative image of cancer and that it "provokes feelings of anxiety" (p. 97). Furthermore, he suggests that people are not highly motivated to get information on cancer or to talk about cancer. Therefore, he saw a need to look at characteristics of participants and nonparticipants, so that guidelines for health education programs could be developed that might encourage people to participate in breast screenings. Based on participation in a Norwegian breast screening program, Van Den Heuvel reported that participants:

1. were younger;
2. were in a higher social class (classified by husband's occupation);
3. were more likely to own a house;
4. had more knowledge of breast cancer;
5. denied cancer less;
6. received medical care more frequently;

7. had fewer feelings of powerlessness;
8. trusted medicine more;
9. heard of the mass screening in the neighborhood;
10. knew people who were participating;
11. read leaflet on breast cancer prior to screening;
12. reacted positively to information provided; and
13. would like to have obtained more information about breast cancer.

In an attempt to examine low participation rates in a mass-screening program for breast and cervical cancers in Belgium, Vermost (1978) compared participants and nonparticipants on the following sets of factors: (1) behavior and attitudes related to illness and health, termed the "health perspective", and (2) sociocultural data such as age, education, social class and family status. Women that were participants in breast screenings tended to be young, married, middle class with two or more children, and had a relatively higher education.

Fink, Shapiro and Lewison (1972) reported on the large scale breast screening program with the Health Insurance Plan of Greater New York (HIP) Study. Through extended efforts, the program was able to get 65 percent of the invited women to participate in the initial screening. Sixty percent of those who participated in the initial screening also had three subsequent annual reexaminations.

Women who participated in all four breast examinations had the following characteristics: (1) they were younger (aged 40-49), (2) they tended to be in an upper social status category, (3) they were more likely to hold professional or technical positions rather than service positions, (4) they reported using medical services more often, and (5) they expressed more concerns about cancer.

In another retrospective survey, Lane and Fine (1983) reported on compliance and noncompliance with mammography referrals. They surveyed noncompliers and asked for their reasons for not obtaining a mammogram. Prominent factors related to noncompliance were as follows: (1) mammography was perceived as too risky and/or radiation presented a possible health hazard (66 percent), (2) advised by a physician, friend, or relative not to have the mammogram (25 percent), and (3) mammography was not adequately explained to them and/or they were not convinced by the staff at the screening program that they should have a mammogram (20 percent). In addition, they found no significant association between age, race, sex, marital status, education and income, and compliance with referrals.

A woman's physician can have a powerful influence on her decision to obtain breast screenings. Women have been surveyed on their perceptions of their physician's influence on getting screenings, and other studies have surveyed

physicians on their attitudes and practices concerning screenings.

Several surveys have found that only a small percentage of physicians follow the American Cancer Society Guidelines (ACS) for screening asymptomatic women (Battista, 1983; CA-A Cancer Journal for Clinicians, 1985; Cummings, Funch, Mettlin, & Jennings, 1983). The survey reported in CA-A Cancer Journal for Clinicians (1985) found that some internists, general/family practice physicians and obstetrician/gynecologists disagreed with ACS guidelines because of high cost and radiation exposure associated with mammography. In addition, physician's knowledge towards breast screening guidelines is often limited and highly variable, and their referral rates are often related to their specialty (i.e., gynecologists send more women for mammography than others) (Mann, Hawes, Ghods, Bednar, & Potchen, 1987; McPhee, Richard, & Solkowitz, 1986). The main reasons that physicians report underutilization of mammography are high cost, risk to the patient, and provider forgetfulness (McPhee et al., 1986).

Much of the current research related to compliance and noncompliance with cancer screenings has focused on female attitudes and beliefs about cancer or early detection and screening of cancer. Kegeles (1969) reported on research results that have attempted to change female beliefs about

personal vulnerability to cervical cancer and in the effectiveness of cytological screening. In summarizing previous research by Rosenstock, Kegles states that "persons who believe themselves vulnerable to an illness are more likely to take actions to prevent or ameliorate that illness than persons who believe themselves to be less vulnerable" (p. 116). These persons, however, are less likely to take cancer control actions if they do not believe the cancer to be amenable to preventive or remedial activity.

The National Institutes of Health reported on a 1979 survey using personal, in-home interviews of women and their spouses/partners concerning their knowledge, attitudes, and practices related to breast cancer (UICC, 1982). Respondents did not know in advance that the topic of the survey was to be cancer. Results showed that cancer was viewed as the most serious health problem facing women currently, and a majority of women and men identified breast cancer as the type of cancer most serious for women. Results also indicated that women are generally well informed about breast cancer and that knowledge about breast cancer had improved since a previous 1973 survey. Knowledge about breast cancer was lower among both urban blacks and urban Hispanics than among women in general. Younger, more educated, and higher-income women were less likely to harbor misconceptions about emotional or social consequences of the disease. Women

between the ages of 18 and 34 tended to have different attitudes about breast cancer than older women. Specifically, younger women were more concerned about breast cancer as a serious health problem for women, and believed that they are more likely to develop the disease than did older women.

Pritchard, Jones, Bode, McDonald, and Galik (1988) interviewed 175 women in a large urban area to identify facilitators and inhibitors related to breast screening activities. In individual interviews, women were asked questions concerning participation. One of the most prevalent inhibiting factors for these women was fear. This included fear of the screening procedure itself (i.e., pain during mammography), fear of what they might find, fear of losing a breast if cancer is found, and fear of rejection by friends or society if cancer is found. Other inhibiting factors reported by these investigators were modesty (i.e., disrobing; physical handling of breast by others), inaccessibility to medical facilities to have screening performed, cost of screening and lack of third party reimbursement.

In response to first impressions of what breast cancer brings to mind, "loss of breast" was mentioned three times more frequently than any other "top-of-mind" thought (UICC, 1982). This underscores the powerful psychological impact that breast cancer has through its association with surgical treatment.

Models Used to Explore Attitudes and Beliefs
Related to Breast Cancer Detection

In addition to exploring motivating and inhibiting factors associated with breast cancer screenings, attempts have been made to model the underlying motivational process associated with compliance. One of the most prominent theoretical frameworks used in the area of health behaviors is the Health Belief Model (Maiman & Becker, 1974; Rosenstock, 1974). The Health Belief Model (HBM) looks at two main elements: (1) health motive or threat and (2) belief about the utility of various courses of action in reducing the threat. The extent to which a health event will become motivating or threatening is determined by two dimensions: (1) the degree to which the individual believes that he or she is susceptible to a given health problem or disease and (2) the extent to which he or she believes that contracting such a disease would have serious consequences for him or her. According to this model, a person must have both of these beliefs to be motivated to take action. The relationship between threat and tendency to act is curvilinear, so that as threat increases, the tendency to act up to an optimal point increases, and beyond that, greater threat may interfere with action (Rosenstock, 1974).

The second element of the model is the belief about the utility of the various courses of action in reducing health

threat. In the case of cancer screening, the individual must believe that the screening is effective, that it will not lead to greater health threats, that it is available to him or her, and that he/she must know where and how to obtain it. He or she must believe that screenings can detect asymptomatic as well as symptomatic disease, and that early detection of disease would improve the prognosis of the disease. Finally, he or she must believe that the personnel and facilities available can do competent screenings.

Calnan and Moss (1984) used Rosenstock's Health Belief Model to predict attendance at a class in breast self examination (BSE) and compliance with the education given in class. The aims of their study were to examine why some women attended the class and others did not, and why some women who attended the class followed recommended advice while others did not. Their results showed some support for the HBM in that four of the six variables that best discriminated between attendance and nonattendance at the class were elements from the major dimensions of the model. They also found that marital status was one of the best discriminators of attendance. In addition, they found support for the HBM in that the best attitudinal predictor of satisfactory practice of BSE was beliefs about the costs and benefits of BSE.

Ajzen and Fishbein's theory of reasoned action has also been used in attempting to predict intentions to perform a particular behavior in a given situation. According to the model, there is a high correlation between behavioral intention and overt behavior (Ajzen & Fishbein, 1980). While it is unlikely that there will be a perfect correlation between intention and behavior, it is expected that an individual will perform that behavior to which they have the strongest intention. Behavioral intentions are determined by an attitude variable and a subjective norm variable. The components of the model are represented by the following regression equation:

$$B \sim BI \approx [w1] A_B + [w2] SN_B ,$$

where

B = overt behavior,

BI = behavioral intention,

A_B = attitude toward performing the behavior,

SN_B = subjective norm toward performing the behavior, and

$w1$ and $w2$ = weights that reflect the relative importance of each component in determining intention.

Attitude and subjective norm are calculated as follows:

$$A_B = \sum_{i=1}^n cb_i \times ce_i$$

where

A_B = attitude,
 cb = consequence belief, and
 ce = consequence evaluation.

$$SN_B = \sum_{j=1}^k eo_j \times mc_j$$

where

SN_B = subjective norm,
 eo = expectation of others, and
 mc = motivation to comply with expectation
of others.

There is not a direct link between beliefs and behavior. Beliefs influence attitudes and subjective norms, which

influence intentions, and intentions influence behavior. According to Ajzen and Fishbein (1980), the attitudinal and subjective norm components of the model are the sole predictors of behavioral intentions. External variables such as demographic variables, personality variables and other psychological variables can only affect behavioral intentions indirectly.

The attitudinal component is composed of two variables: (1) belief about the outcome or consequence of performing the behavior and (2) evaluation of those consequences. Attitude is a general feeling of favorableness or unfavorableness toward any concept. In general, the more favorable a person feels towards a particular behavior, the more likely he should intend to perform that behavior.

The subjective norm component is also composed of two variables: (1) perceived expectations of significant others (normative beliefs) and (2) person's motivation to comply with the expectation of significant others. Generally, the more a person perceives that others who are important to him think he should perform a behavior, the more likely it is that he will intend to perform that behavior.

A key aspect of the model is that attitude and subjective norm may be of varying importance in determining intentions to perform a behavior. For this reason, weights reflecting the importance of each component (w_1 and w_2 in the

equation) are incorporated into the theory. For some behaviors, for example, the attitudinal component will be the major determinant of intentions, and for other behaviors, subjective norm will be the major determinant.

One of the criticisms of the model proposed by the theory of reasoned action that has received the most attention is that the model does not take external variables into account, such as prior behavior (Bentler & Speckart, 1979), habit (Wittenbraker, Gibbs, & Kahle, 1983) and personal and moral norms (Bagozzi, 1981). According to Ajzen and Fishbein (1980), however, "the effects of external variables are mediated by beliefs, and therefore, taking external variables into account (in addition to beliefs) is not expected to improve prediction of attitudes and subjective norms" (p. 91). They note that external variables will not improve prediction of intentions for the same reasons. Although Ajzen and Fishbein do not deny that external variables may be related to behavior, their contention is that these external variables affect behavior indirectly.

Horne, McDermott, and Gold (1986) used Fishbein's model to predict intention of university employees to perform breast self examination (BSE) and to distinguish between levels of BSE practice. To test the components of the model, items were constructed according to guidelines for operationalization of the model as determined by Fishbein and

Ajzen (1975). The questionnaire was mailed to 350 randomly selected women at a large university. The final sample contained 163 people, resulting in a response rate of only 46.6 percent. Respondents were classified into one of three categories, each representing a different level of BSE practice. The three groups were then compared for differences in their beliefs about the consequences of performing BSE, the evaluation of those consequences, their perceptions of BSE beliefs held by significant others and their motivation to comply with the expectations of significant others. Although the model significantly predicted BSE intentions, it only accounted for 22 percent of the variance.

Calnan and Moss (1984) incorporated the "normative influences" variable into their study and found that women who were encouraged by significant others were more likely to attend an educational program about BSE than women who did not have encouragement by significant others. However, they did not find a significant relationship of this variable to attendance at a breast screening center.

Sullivan and Joyce (1981) also used the Fishbein model to investigate what forces may serve to motivate or impede performance of BSE. In particular, they used the model to understand how preventive health programs like BSE affect the mediating constructs preceding behavior. A pretest/posttest methodology was employed, and the subjects

consisted of seventy-two women employed at a large university. The pretest involved gathering information on subjects' prior preventive health activities, personal and family histories, beliefs about breast self-examination, and intentions to perform BSE. After administration of the pretest, the treatment group received three different types of education about BSE: (1) an educational program taught by a female Ed.D. who stressed the importance of BSE; (2) a motion picture that showed procedures for performing BSE; and (3) personal instruction on the proper techniques for performing BSE. Their results suggested that public education programs do not produce desired changes in attitudes toward BSE or intentions to perform BSE. However, the program did influence two beliefs concerning BSE. These beliefs were that (1) BSE will reassure women of their health status and (2) BSE will reduce anxiety about finding a lump in the breast.

Other studies have also employed Fishbein's Model to predict various health-related behaviors. In a study by London (1982), Fishbein's Model was used to identify attitudinal and social normative factors to predict intentions of preadolescents to abuse alcohol. A questionnaire was developed to assess attitudes, beliefs, and intentions related to alcohol consumption and administered to 650 fifth- and seventh-grade students. Results of the multiple regression

analysis showed that the model was a significant predictor of adolescent's intentions to abuse alcohol. Although only 14 percent of the variance was accounted for seventh graders, and 12 percent of the variance was accounted for by fifth graders, the results nonetheless supported the ability of the Fishbein model to predict behavioral intention. The author hypothesizes that the low magnitude of the multiple correlation coefficients may be due to external factors that determine deviant behaviors (e.g., alcohol abuse), which the model does not encompass.

Davidson and Jaccard (1975) employed the Fishbein Model to predict a woman's intention to have a child within a specified time frame. Potential subjects were randomly selected using a stratified random sampling technique from the Urbana-Champaign city telephone directory. Data were collected from a closed-format telephone interview with 270 women. Specifically, the following hypotheses related to the Fishbein Model were tested: (1) an individual's intention to perform a given behavior can be predicted from a linear combination of his attitude toward performing the behavior and his normative beliefs weighted by his motivation to comply with those norms, and (2) an individual's attitude toward performing a given behavior is a function of his beliefs about the consequences of performing that behavior and the evaluation of those consequences. Results of

the study suggested that the data significantly supported the two hypotheses. The data also indicated the usefulness of both components (attitudinal and normative beliefs) in the prediction of family planning intentions.

Pender and Pender (1986) used the theory of reasoned action to predict intentions to exercise regularly, maintain/attain recommended weight and avoid stressful life situations. Results indicated that both attitude and subjective norms significantly predicted intention to exercise regularly, but accounted for only 5.5 percent of the variance. Only the attitudinal component of the model significantly predicted intention to maintain/attain recommended weight and to avoid highly stressful situations. The subjective norm did not influence intentions to maintain/attain weight or avoid stressful situations. While the findings of this study provided limited support for the theory of reasoned action, the amount of variance accounted for was quite small.

While both the Health Belief Model and the theory of reasoned action have utility in predicting intentions to perform preventive health behaviors, there have been relatively few studies dealing specifically with the early detection of breast cancer. The majority of studies in the area of early detection and screening for breast cancer have used the aforementioned models mainly to predict intentions

to perform breast self examination. Therefore, there is a need for future studies that employ a theoretical framework with which to explore motivating and inhibiting factors related to obtaining mammograms and breast physical examinations.

Health Promotion Strategies

Relatively few health promotion programs reported in the literature have attempted to alter attitudes, knowledge and/or practices of women regarding mammography. In addition, these studies did not employ program or research evaluation techniques to assess the impact of the program(s).

One attempt at increasing mammography usage and increasing both public and physician awareness of the value of mammography was the initiation of a community project in Illinois sponsored by the Illinois Division of the American Cancer Society. The goals of the program were to disseminate information on breast cancer control, offer reduced-cost mammography to women over the age of 35, and to evaluate and assess the overall effect of the project (Winchester, Lasky, Sylvester, & Maher, 1988). Promotional strategies designed to inform women and physicians about the project included four news segments on prime-time television, newspaper ads and informational mailings to primary

care physicians. The television program addressed issues such as radiation exposure, mammographic procedures, and the importance of obtaining mammograms and breast physical examinations.

The promotional programs and the reduced cost of the screening mammogram resulted in a total of 9,307 women who were screened during a one month period. Based on a follow-up survey of women in the television viewing area, the number of women with more favorable attitudes towards mammography increased, and the number of women expressing fears about radiation decreased (Winchester et al., 1988). While the percentage of women who indicated that they will have routine mammograms increased after the promotional program, this percentage was only 17 percent (Winchester et al., 1988). These attitudinal results of this project must be interpreted with caution since the promotional efforts did not include an evaluation component. In addition, because this study did not employ a control group, the interpretation of program results may be biased.

Another community-based cancer educational program was conducted by Wright State University School of Medicine in coordination with the county unit of the American Cancer Society (Luciani, 1986). It was determined that a commercial cable television program had the potential to reach a large audience on a regular basis. The objectives of the

program were to inform the public about prevention, early detection and treatment of cancer. Local newspapers and radio stations announced the program. A physician from the medical school is interviewed about a specific topic related to cancer, and a list of consumer questions are addressed (based on telephone surveys) during each program. While the effectiveness of this promotional program has not yet been assessed, there has been widespread community interest in the program by the general public as well as by medical students, nurses and other health professionals.

In a New York city black community, a promotional campaign was conducted to increase awareness and utilization of a free breast screening and educational center in the community (Adams & Kerner, 1982). Promotional activities and knowledge about the Center were evaluated in terms of their effectiveness in attracting clients and other sub-groups which had been targeted by the program. Based on data from an initial intake questionnaire at the Center, it was determined that the most consistent source of knowledge about the Center was from word-of-mouth from friends and relatives. Analyses showed that radio, newspapers and brochures were not effective in increasing utilization. Based on these findings, promotional efforts are now being aimed at churches, schools and other community groups.

Alexander and McCullough (1981) identified promotional techniques aimed at informing low-income and minority women of a free Cervical Cancer Screening Program. Of those who attended the clinic, 46 percent reported that they received their information about the clinic from either a friend and/or a staff person from another agency. Over one third of those screened reported that the mass media (i.e, radio and television) was an information source for them. Only about 1 percent of those screened reported that brochures (including direct mailings) provided them with information about the clinic. Based on their findings, they concluded that screenees should be urged to inform their friends and relatives about the services, since these were the most prevalent sources of information. Secondly, agencies in the community that may be referral links should be contacted periodically to keep them abreast of the clinic services provided (Alexander and McCullough, 1981).

In a similar study, Hulka (1967) reported on methods which were successful in stimulating medically indigent women to participate in a cervical cancer screening program. The results of her surveys indicated that one of the most potent techniques used to stimulate women to attend a clinic was referral by other female patients. Also, referrals from private physicians have a high percentage of patient acceptance.

Summary

Although the efficacy of mammography and breast physical examinations in reducing the morbidity and mortality from breast cancer has been well established, these screening techniques are underutilized. There is an entire system of influences that affect a woman's decision to participate in breast screening activities.

The main influences on a woman's decision to participate or not to participate in breast screening programs are physician influence, health concerns, costs of screenings, social support systems, fear of finding a lump, sociodemographics and her knowledge and attitudes towards breast screening activities. These factors together form a complex system of influences that must be considered when attempting to increase the proportion of women who obtain breast screenings.

In addition to trying to uncover reasons that women do not obtain breast screenings, various studies have employed the Health Belief Model and Ajzen and Fishbein's theory of reasoned action to look at underlying motivational processes associated with compliance and noncompliance. Both models have been useful in predicting behavioral intentions related to breast self-examination, but further studies using these models specifically in determining intention

to participate in mammographic screening programs need to be conducted.

CHAPTER 3

METHODOLOGY

Introduction

This chapter is divided into the following topics: selection of sample, instrumentation, collection of data, data analysis, and summary.

Selection of Sample

Female employees ages 40 and older at the University of Tennessee at Knoxville (UTK) were selected to participate in the study. While only 375 eligible women were needed for a 33 percent return rate, the total number of women in this age group was not known prior to the initial mailings. Therefore, a total of 700 women (from a list of approximately 3,000) were initially selected to determine eligibility. The potential subjects were selected from the UTK faculty and staff telephone directory using a systematic sampling technique. A random numbers table was used to determine the starting point in the list, and every fourth female from the list of approximately 3,000 was selected until a sample of 700 was obtained (Rubinson & Neutens, 1987). The procedure

for determining eligibility to participate is described in the section, "Collection of Data." If a sufficient number of women in the target age group failed to respond, then the procedure for selecting women from the faculty/staff directory would be repeated.

In order to determine the number of cases necessary to have the specified probability of rejecting the null hypothesis at the .05 level, a power analysis was performed using the formula by Cohen and Cohen (1975).

$$n = \frac{L}{f^2} + k + 1 ,$$

where

L = table value based on the df associated with
the source of Y variance being tested,

f^2 = the effect size, and

k = the number of independent variables being tested.

The L value is the table value based on the degrees of freedom associated with the source of Y variance being tested at a specified alpha and a specified power. In this study, the alpha level was set at .05 and the power was set at .80. According to Cohen and Cohen (1975), .80 is a conventional power level. An effect size of .09, which is

considered to be a medium effect size was used. According to Cohen (1969), the squared correlation coefficients in many of the studies conducted in the behavioral sciences are of this magnitude. Furthermore, the R squares in many of the studies reviewed for this research ranged from .05 to .22. For this study, it was determined that 100 cases were needed in order to detect a population R square as small as .09 ($\alpha = .05$) with an 80 percent probability (power). Because the instrument had less than perfect reliability, an additional 25 subjects (25 percent of 100) were added to the 100, which resulted in 125 subjects needed for the study.

Instrumentation

In order to construct the attitude scales, salient beliefs about intentions to participate in breast screening activities must first be identified from a representative sample of the population in question. According to Ajzen and Fishbein (1980), a person can only pay attention to a small number of beliefs at a time. According to the theory, these salient beliefs are the immediate determinants of a person's attitude. Similarly, salient referents (people or groups of people who would influence a person's decision to

perform/not perform a given behavior) are identified in order to construct the subjective norm scales.

To identify salient beliefs, a random sample of respondents, representative of the population studied, was asked a series of open-ended questions to identify salient beliefs and normative beliefs related to the behavior in question. Twenty-five women ages 40 and older from east Tennessee were telephoned by the researcher and asked two open-ended questions about beliefs regarding mammography and breast physical examination. The 25 women were randomly selected from a mailing list obtained from The Women's Center at the University of Tennessee Medical Center at Knoxville (UTMCK). Individuals were asked to list the advantages and disadvantages of obtaining a mammogram. The responses were then listed in order of frequency and the 11 most frequently mentioned outcomes were incorporated into the questions measuring attitudes towards performing the behavior.

Salient referents were also identified using an open-response format. The 25 respondents were asked to identify people or groups of people whose opinions they valued and who might influence their decisions to participate or not participate in breast screening activities. The 5 referents most frequently mentioned were utilized to develop the subjective norm scales in the instrument.

From the interview data, it was estimated that a questionnaire consisting of 41 semantic differential scales would be developed following the protocol described by Ajzen and Fishbein (1980). The number of items to be included on the final questionnaire may be more or less than the 41 proposed here, since development of the questionnaire is dependent upon the responses from the initial group of respondents. Questions were developed to assess each component and subcomponent of the model: (1) attitudes towards a behavior, which has a consequence belief component and a consequence evaluation component and (2) subjective norms, which includes expectations of others and motivation to comply with expectations of others.

The instrument would consist of approximately the following items: 1 item measuring behavioral intention, 20 items measuring attitude (10 items measuring consequence beliefs and 10 items measuring consequence evaluations), 20 items measuring subjective norms (10 items measuring expectations of others' beliefs and 10 items measuring motivation to comply with expectation of others). In addition, 2 open-ended questions were included to determine reasons for women not intending to participate in a mammography screening program within the next two years and to ascertain factors that might make them change their mind about having a mammogram in the future. Behavioral intention, consequence

beliefs, expectations of others' beliefs and motivation to comply with expectations of others were scored on a 7-point scale from 1 (unlikely) to 7 (likely). Consequence evaluation scores were scored on a seven-point scale from 1 (good) to 7 (bad) (Appendix A--final instrument).

Attitudes towards performing the behavior were calculated by multiplying each consequence belief score by the corresponding consequence evaluation score and then summing the products. The subjective norm regarding the behavior was calculated by multiplying the motivation to comply with expectation of others by the expectations of others' beliefs scores and then summing the products.

The questionnaire was pilot tested using a group of 25 women ages 35 and older at the University of Tennessee at Knoxville. In order to recruit potential pilot subjects, the researcher went to various departments on the UT campus and explained the study to female employees who were present at the time. The researcher determined eligibility (i.e., those 35 years of age and older) by interviewing potential subjects. If the women who were interviewed met the eligibility requirements and were willing to participate in the pilot study, the researcher handed them a questionnaire with an attached cover letter (Appendix B) and detailed instructions explaining the scales and how responses should be made (Appendix C). In addition, they received a letter

with instructions on how to evaluate the questionnaire with regard to item clarity, readability, and length of time to complete it (Appendix D). Potential pilot subjects were asked to return the completed questionnaire in the attached self-addressed, stamped envelope within two days.

Cronbach's alpha, which computes internal consistency reliability, was determined using the statistical package "SPSS/PC."

Collection of Data

In order to determine how many women would be eligible to participate in the study, a sample of the 700 women who were randomly selected from the faculty/staff directory were telephoned. First, the interviewer introduced herself and explained the purpose of the research study. Women were then informed that potential subjects must be 40 years of age or older to participate in the study and were asked if they met this requirement. If they were 40 years of age or older, they were asked if they would volunteer to participate in the study. The interviewer told eligible potential subjects that they would be receiving the questionnaire in the mail and emphasized the importance of completing it. It was also emphasized that participation was voluntary and anonymous.

Immediately after determining eligibility and willingness to participate, potential subjects were sent a cover letter attached to the front of the revised questionnaire which briefly explained the purpose of the research and informed subjects of the anonymity and confidentiality of the study. Detailed instructions explaining the scales and describing the way in which responses should be made to each question were attached to the cover letter, in front of the questionnaire. Self-addressed, stamped envelopes were provided in which the completed questionnaire could be anonymously returned to the researcher. Subjects were given a two-week deadline to return the completed questionnaire.

All paridentiticipants were asked to complete sociodemographic information that accompanied the questionnaire. The following information was included on the questionnaire: age, race, marital status, education, household income and occupation. In addition, subjects were asked if they had obtained a mammogram in the last year and if they had had breast cancer.

All responses on the instruments were strictly confidential. Each respondent was asked to enter the month, day and year of birth in the space provided for purposes of data analysis and subsequent verification data analysis. After collection of the data, the data were entered into the computer for analysis. Items on both scales had been

previously coded for ease in entering data. Items left unanswered were coded as missing data. The statistical analyses were computed using the statistical package "SPSS/PC". Data were stored on the researcher's personal microcomputer.

In order to verify intention to participate in a mammography screening program, women who came to the Mobile Medical Unit van on the campus for a mammogram in November were asked whether or not they participated in the initial survey one month prior to the screening. All women at the time of screening were asked to provide the month, day and year of birth on the intake questionnaire. These identification numbers were then matched with the identification numbers from the first questionnaire for further analyses.

Approximately 20 percent of the nonrespondents were randomly selected for a telephone survey to determine if those who did not participate were different than those who did. The following information was ascertained: reason(s) for not participating in the study, whether or not a mammogram had been obtained in the last year, intention to obtain a mammogram within the next two years, educational level and occupation. The questionnaire for nonrespondents may be found in Appendix E.

Data Analysis

Descriptive statistics, including percentages and means were performed to describe the sample. Multiple regression analyses were performed to test whether the theory of reasoned action was a significant predictor of a woman's intention to participate in breast screening activities. The alpha level for testing significance was set at .05.

Correlations between intention to participate in a mammography screening program and actual participation in a mammography screening program (on campus) were calculated in order to verify intention and to pragmatically test the model.

Summary

Women ages 40 and older at the University of Tennessee at Knoxville were selected to participate in the study. A questionnaire was mailed to potential subjects. Data from the questionnaire were analyzed to determine whether Ajzen and Fishbein's theory of reasoned action significantly predicts a woman's intentions to participate in a mammography screening program. Actual participation in a mammography screening program was used to further verify women's intentions to participate. The results of the data analyses will

be used to develop guidelines for future marketing and health promotion strategies aimed at encouraging women to participate in breast screening activities.

CHAPTER 4

ANALYSIS OF THE DATA

Introduction

Data collected by conducting a mail survey of women ages 40 and older at the University of Tennessee at Knoxville (UTK) were analyzed to identify and verify factors that determine a woman's intention to participate in a mammography screening program.

This chapter is organized into the following sections: identification of salient beliefs and salient referents, pilot description, sample description, follow-up of nonrespondents, data presentation, verification of intention, and implications of data.

Identification of Salient Beliefs
and Salient Referents
(Research Questions 1 and 2)

In order to obtain information for constructing the attitude and belief scales, 25 women over the age of 40 from east Tennessee were randomly telephoned from a mailing list obtained from the Women's Center at The University of Tennessee Medical Center at Knoxville. They were asked to list (1) the advantages of participating in a mammography

screening program; (2) the disadvantages of participating in a mammography screening program; and (3) people who might influence your decision to participate or not participate in a mammography screening program.

The eleven most frequently mentioned advantages and disadvantages (salient beliefs) were incorporated into the attitude scale (Table 1). The five most frequently mentioned people who might influence a woman's decision to obtain or not obtain a mammogram (salient referents) were incorporated into the normative belief scale (Table 2).

Pilot Description

Twenty-five women ages 35 and older at the University of Tennessee at Knoxville were randomly selected to participate in the pilot testing of the initial questionnaire during August 1989. The questionnaires, consent forms and self-addressed stamped envelopes were personally handed to women in various departments on the campus. Twenty-four of the 25 questionnaires were returned, resulting in a 96 percent return rate. All of the returned questionnaire (n=24) were used in the analyses.

Sociodemographics for the pilot sample are listed in Table 3. The 24 respondents ranged in age from 35 to 61 years old, with a mean age of 45.6. Approximately

Table 1

Advantages and Disadvantages of Participating
in a Mammography Screening Program
(Salient Beliefs)

Advantages	Disadvantages
1. Mammography will detect lumps before they can be felt.	1. Mammography costs too much/ insurance does not cover the cost.
2. Mammography detects cancer early.	2. The fear that a lump might be found.
3. Having a mammogram will decrease my anxiety about developing breast cancer.	3. Mammograms are painful.
4. Having a mammogram will result in earlier treatment of breast cancer if something is found.	4. Mammography will cause cancer.
	5. Mammography only benefits women over the age of 65.
	6. Having a mammogram is embarrassing.
	7. It takes too much time to go in for a mammogram.

*Note: Responses listed in order of frequency.

Table 2

People Who Might Influence a Woman's Decision
to Obtain or Not Obtain a Mammogram
(Salient Referents)

-
1. Physician
 2. Spouse/"significant other"
 3. Parents or other close relatives
 4. Friends
 5. Children
-

*Note: Responses listed in order of frequency.

Table 3
Sociodemographics for the Pilot Sample*

Category	Percent	Number
Race (n=24)		
White	91.7	22
Black	8.3	2
Marital Status (n=24)		
Never married	20.8	5
Married	42	10
Divorced	37.5	9
Separated	0	0
Widowed	0	0
Education (n=24)		
Less than high school	0	0
High school diploma	12.5	3
Some college	29.2	7
Technical school diploma	8.3	2
College degree	0	0
Some graduate school	0	0
Graduate degree	50	12
Occupation (n=22)		
Faculty	20.8	5
**Staff	75	17
Income (n=24)		
Less than \$10,000	8	2
\$10,000-20,000	25	6
\$20,001-30,000	20.8	5
\$30,001-40,000	16.7	4
\$40,001-50,000	16.7	4
\$50,001-60,000	8.3	2
>\$60,000	4.2	1

*Total pilot n=24. One category contains missing data.

**Appendix F lists jobs classified as "staff".

Note: Percentages may not add to 100 due to rounding.

91.7 percent (22) of the women were white and 8.3 percent (2) were black. Forty-two percent (10) were married, 37.5 percent (9) were divorced, and 20.8 percent (5) were never married.

All of the women in the pilot study were employed at the University of Tennessee at Knoxville. The majority of the respondents were classified as "staff" (75 percent, 17), with the majority of those classifying themselves as secretarial. The remaining respondents (20.8 percent, 5) classified themselves as either "professor" or "instructor." One person did not answer this question.

The majority of the pilot sample (50 percent, 12) had a graduate degree; 29.2 percent (7) had "some college"; 12.5 percent (3) had a high school diploma; and 8.3 percent (2) had a technical school degree.

Approximately 8 percent (2) of the pilot sample reported a yearly household income of less than \$10,000; 25 percent (6) reported it as \$10,001 to \$20,000; 20.8 percent (5) \$20,001 to \$30,000; 16.7 percent (4) \$30,001 to \$40,000; 16.7 percent (4) \$40,001 to \$50,000; 8.3 percent (2) \$50,001 to 60,000; and 4.2 percent (1) more than \$60,000.

The initial questionnaire contained two items measuring behavioral intention, 22 items measuring attitude, 15 items measuring subjective norm and two open-ended questions

related to reasons for not intending to have a mammogram within the next two years.

The pilot sample was asked to make any comments regarding item clarity and readability. Based on comments, four of the questions on the subjective norm scale were eliminated due to redundancy. Two questions were added and preceded to the sociodemographic questions. They were: "Have you had breast cancer?" and "Have you had a mammogram within the last year?". The total number of items included in the final instrument was 48 (including the demographic data).

In addition to the aforementioned omissions, some grammatical changes were made in order to clarify questions, based upon comments made on the questionnaire concerning item clarity. Based on data received from the pilot sample, it was determined that the average amount of time it took to complete the questionnaire was 15 minutes.

The instrument was subsequently evaluated for internal consistency reliability using Cronbach's alpha. The analyses revealed a reliability coefficient of .56 for the attitude scale and a reliability coefficient of .62 for the subjective norm scale. Although three of the questions yielded an alpha coefficient of .4 and eliminating these questions would have raised the overall reliability coefficient, it was decided that these questions would not be

eliminated because they provided important information regarding attitudes towards mammography.

It should be noted that higher reliability coefficients would have resulted in a more valid instrument. However, similar studies which measured attitudes and beliefs related to early detection of breast cancer had coefficient alphas ranging from .61 to .83 (Horne, McDermott & Gold, 1986) and from .56 to .71 (Zapha, Stoddard, Costanza & Greene, 1989).

Return Rate and Sample Description

The revised instrument, cover letter and a self-addressed stamped envelope were sent to a random sample of 298 women ages 40 and older in September 1989. The sample was selected from the UTK faculty and staff telephone directory using a systematic sampling technique. A random numbers table was used to determine the starting point in the list, and every fourth female from a list of approximately 3,000 was selected until a sample of 700 was obtained. From the initial sample of 700, 298 women ages 40 and older were successfully contacted by telephone and consented to participate in the study.

After approximately three weeks, 202 questionnaires had been completed and returned, resulting in a 68 percent return rate. Of the 202 questionnaires returned, three were

not used in the analyses. One of the respondents was under 40 years of age and two of the questionnaires had missing data on more than half of the questionnaire and therefore were not used in the data analyses.

Sociodemographic data for the total sample may be found in Table 4. The 199 respondents ranged in age from 40 to 72 years old, with a mean age of 50.1. The sample was predominately white (96.4 percent, 188). Blacks made up 3.5 percent (7) of the sample. Approximately 64 percent (128) of the women were married, 18 percent (36) were divorced, 10 percent (21) were never married and 6.5 percent (13) were widowed.

Because the sample was taken from the faculty\staff directory, all of the respondents were employed. The majority (74.5 percent, 149) were classified as "staff" and 19.5 percent (39) were classified as "faculty". Respondents were classified as "faculty" if they classified themselves as instructor, professor or administrator. A listing of job titles classified as "staff" may be found in Appendix F.

The majority of the respondents (41.5 percent, 83) had "some college"; 23.5 percent (47) had a graduate degree; 15 percent (30) had a high school diploma; 6 percent (12) reported a technical school diploma; 8 percent (16)

Table 4
Sociodemographics for the Total Sample*

Category	Percent	Number
Race (n=195)		
White	96.4	188
Black	3.5	7
Marital Status (n=198)		
Never married	10	21
Married	64	128
Divorced	18	36
Separated	0	0
Widowed	6.5	13
Education (n=196)		
Less than high school	0	0
High school diploma	15	30
Some college	41.5	83
Technical school diploma	6	12
College degree	8	16
Some graduate school	4	8
Graduate degree	23.5	47
Occupation (n=188)		
Faculty	19.5	39
**Staff	74.5	149
Income (n=189)		
Less than \$10,000	.5	1
\$10,000-20,000	15.5	31
\$20,001-30,000	14	28
\$30,001-40,000	20	40
\$40,001-50,000	14.5	29
\$50,001-60,000	12	24
>\$60,000	18	36

*Total sample n=199. Each category contains missing data.

**Appendix F lists jobs classified as "staff".

Note: Percentages may not add to 100 due to rounding.

had a college degree and 4 percent (8) reported that they had "some graduate school".

Of the 189 respondents who reported yearly household income, 15.5 percent (31) reported it as \$10,001 to \$20,000; 14 percent (28) \$20,001 to \$30,000; 20 percent (40) \$30,001 to \$40,000; 14.5 percent (29) \$40,001 to \$50,000; 12 percent (24) \$50,001 to \$60,000 and 18 percent (36) more than \$60,000. Less than 1 percent (1) of the respondents reported an income of below \$10,000 per year.

Pearson correlation coefficients were computed between each sociodemographic variable and intention to obtain a mammogram on the Mobile Medical van, intention to obtain a mammogram within the next two years, subjective norm and attitude. The results are presented in Appendix G.

With regard to other information elicited from the sample, 2 percent (4) of 198 respondents reported that they have had breast cancer and 98 percent (194) reported that they have not had breast cancer.

Nineteen percent (38) of 198 respondents said they intended to obtain a mammogram while the Mobile Medical van was on campus. Of 189 respondents, 90 percent (171) said they intended to have a mammogram within the next two years and 9 percent (18) reported that they did not intend to have a mammogram within the next two years.

Approximately 51 percent (100) of 197 respondents reported that they had obtained a mammogram within the last year and 49.2 percent (97) reported that they had not.

With regard to intention to obtain a mammogram while the Mobile Medical van was on campus, 61 percent (61) of the 100 women who had obtained a mammogram within the last year reported that it was "extremely unlikely" that they would obtain a mammogram when the Mobile Medical Unit van was on campus, 18 percent (18) reported that it was "quite unlikely", and 2 percent (2) reported that it was "slightly unlikely." Only 5 percent (5) of those who had obtained a mammogram within the last year reported that it was "extremely likely" that they would obtain a mammogram when the van was on campus, while 7 percent (7) said it was "quite likely" and 2 percent (2) reported that it was "slightly likely" (Table 5).

Comparatively, of the 97 women who reported that they had not had a mammogram within the last year, 32 percent (31) said that it was "extremely unlikely" that they would obtain a mammogram when the Mobile Medical Unit van was on campus; 26.8 percent (26) reported that it was "quite unlikely"; and 6.2 percent (6) reported that it was "slightly unlikely." Approximately 10 percent (10) reported that it was "extremely likely" that they would obtain a mammogram when the van was on campus, 8.2 percent (8) reported that it

Table 5

Responses to "Do You Intend to Have a Mammogram
When the Mobile Medical Van Is on Campus?"

Response Category	Women Who <u>Had</u> a Mammogram Within the Last Year*		Women Who Did <u>Not</u> Have a Mammogram Within the Last Year**	
	Percent	Number	Percent	Number
Extremely unlikely	61	61	32	31
Quite unlikely	18	18	26.8	26
Slightly unlikely	2	2	6.2	6
Slightly likely	2	2	6.2	6
Quite likely	7	7	8.2	8
Extremely likely	5	5	10.3	10

*n = 100

**n = 97

was "quite likely", and 6.2 percent (6) reported that it was "slightly likely" (Table 5).

With regard to intention to obtain a mammogram within the next two years, 94 percent (94) of the 100 women who had obtained a mammogram within the last year reported that they intended to obtain a mammogram within the next two years and 2 percent (2) reported that they did not intend to obtain a mammogram within the next two years (Table 6).

Also with regard to intention to obtain a mammogram within the next two years, 79.4 percent (77) of the 97 women who did not have a mammogram within the last year reported that they intended to have a mammogram within the next two years and 16.5 percent (16) of the 97 women reported that they did not intend to have a mammogram within the next two years (Table 6).

Follow-Up of Nonrespondents (Research Question 5)

A phone call follow-up of a sample of the nonrespondents was conducted in November 1989. It was determined that 20 percent of those who did not return the questionnaire (n=19) would be contacted by telephone and asked five questions. One question ascertained the reason(s) for not responding; two questions ascertained information about

Table 6

Responses to "Do You Intend to Have a Mammogram
Within the Next Two Years?"

Response Category	Women Who Had a Mammogram Within the Last Year*		Women Who Did Not Have a Mammogram Within the Last Year**	
	Percent	Number	Percent	Number
Yes	94	94	79.4	77
No	2	2	16.5	16

*n = 100

**n = 97

mammography; and two questions ascertained sociodemographic information (Appendix E).

The reasons cited most frequently for not returning the questionnaire were: "I forgot" and "I was too busy". Two of the nonrespondents reported that they never received the questionnaire. The majority of those contacted for follow-up were "staff" (15) and the remaining 4 were "faculty". Of those who were staff, 13 were secretaries.

Of the 19 women contacted, 47 percent (9) had obtained a mammogram within the last year and 53 percent (10) had not had a mammogram within the last year. These responses were only slightly different than those who responded to the questionnaire, in which approximately 50 percent of the respondents reported having had a mammogram within the last year.

Of the 19 women telephoned, 95 percent (18) reported that they intend to have a mammogram within the next two years. One woman answered that she was "unsure" whether she would or not.

Chi-square analyses showed that there were no significant differences between questionnaire respondents and nonrespondents with regard to (1) having a mammogram within the last year, (2) intending to have a mammogram within the next two years, (3) educational level and (4) occupation.

Presentation of Data
(Research Question 3)

Multiple regression analysis was used to determine the extent to which attitudes and subjective norms explained intention to obtain a mammogram while the Mobile Medical Unit van was on campus in November 1989. Pearson r correlations were computed between intention, attitude and subjective norm. The correlation coefficient between intention and attitude was .15 and the correlation between intention and subjective norm was .19. Both failed to reach significance at the $p \leq .05$ level.

A regression equation was constructed to determine which variable(s) were significant in predicting intention to obtain a mammogram when the Mobile Medical Unit van was on campus (Table 7). When both attitude and subjective norm were entered as a block into the equation, intention was not significantly predicted ($F = 2.19, p > .05$). The test for interaction between attitude and subjective norm in predicting intention was also nonsignificant ($F = 1.50, p > .05$). Because only 38 subjects intended to have a mammogram on the Mobile van, failure to reach significance may have been due to restriction of range. That is, there is reduced variance in the dependent variable, which reduces the correlations

Table 7

Summary of Multiple Regression Analyses
 (Intention to Obtain a Mammogram
 on the Mobile Medical Van)

Variables in Equation	R	R ²	F	t (R ² change)
Attitude	.15	.02	1.97	-.79
Subjective norm	.22	.05	2.19	1.54
Interaction (Subjective norm X attitude)	.23	.05	1.50	-.40

between the independent variables and the dependent variable.

It should be noted that the intention question from which the previous analyses were performed was very specific and was related to having a mammogram when the UTMCK Mobile Medical van was on campus in November 1989. Ninety percent (171) of the women who answered the questionnaire said they intended to have a mammogram, but not on the Mobile Medical van. In view of this, another regression analysis was performed using the other intention question, "Do you intend to obtain a mammogram within the next two years?"

Correlations were computed between intention to obtain a mammogram within the next two years, attitude and subjective norm. The correlation coefficient between intention and attitude was significant ($r = .33$, $p < .001$). The correlation between intention and subjective norm was also significant ($r = .33$, $p < .01$).

A regression equation was constructed in order to test which variable(s) were significant in predicting a woman's intention to obtain a mammogram within the next two years (Table 8). When both attitude and subjective norm were entered as a block into the equation, intention was significantly predicted ($F = 14.389$, $p < .0001$) and accounted for 27 percent of the variance in intention. Attitude was a significant predictor of intention over and above subjective

Table 8

Summary of Multiple Regression Analyses
 (Intention to Obtain a Mammogram
 in the Next Two Years)

Variables in Equation	R	R ²	F	t (R ² change)
Attitude	.49	.24	**24.65	**4.15
Subjective norm	.52	.27	**14.39	-1.89
Interaction (Subjective norm X attitude)	.60	.36	**14.52	*-3.32

**p < .0001

*p < .001

norm ($t = .4.155$, $p < .0001$), while subjective norm was not a significant predictor of intention over and above attitude ($t = -1.839$, $p > .05$). The test for interaction between attitude and subjective norm was a significant predictor of intention ($F = 14.516$, $p < .0001$).

Verification of Intention (Research Question 4)

In November 1989, the Mobile Medical Unit van from the University of Tennessee Medical Center at Knoxville (UTMCK) was on campus for two weeks and offered mammography to employees, students and spouses of employees ages 40 and older. The radiology technician on the van was instructed by the researcher to ask each woman who came to the van for a mammogram whether or not she had received a questionnaire about breast cancer screenings in the mail a few weeks ago. The intake health history questionnaires from women who responded that they had, or that they "thought so" were separated from the others after she had completed her health history. At the end of the two week period, the head radiological technician gave the researcher a list of women who said they had received a questionnaire or "thought they had received one" so that the identification number could be matched with those women who said they "intended to obtain a mammogram when the Mobile Medical van was on campus."

After matching identification numbers of those who had a mammogram with those who intended to have a mammogram, it was determined that of the 38 women who reported they intended to have a mammogram while the Mobile Medical Unit van was on campus, 29.7 percent (11) actually went to the Mobile Medical van for a mammogram. The correlation coefficient between those who intended to go to the Mobile Medical van and behavior was significant ($r = .45$, $p < .01$). It should be noted again that behavior is not formally part of the theory of reasoned action, but in order to pragmatically test the theory and to ascertain how well intention actually predicts behavior, it was decided to calculate the percentage of intenders who actually went for a mammogram.

Implications of Data (Research Question 6)

Based on the statistical analyses of data related to intention to have a mammogram while the Mobile Medical van from UTMCK was on campus, it was found that in this population, neither attitude nor subjective norm played a significant role in a woman's intention to obtain a mammogram on the Mobile Medical van.

However, when statistical analyses were performed using the more general intention question, "Do you intend to obtain a mammogram within the next two years?", it was found

that both attitude and subjective norm together in the equation predicted intention, and attitude alone was a stronger predictor of intention over and above subjective norm.

Practically speaking, both attitude and subjective norm should be taken into account for purposes of marketing and health promotion. However, because attitude plays a stronger role than subjective norm in predicting intention, this component should receive the greatest emphasis.

With regard to attitudes, the advantages of mammography, such as early detection, earlier treatment, and reducing anxiety about developing breast cancer should be emphasized. Rather than focusing on the negative aspects of mammography (e.g., fear of finding a lump, fear of the procedure, etc.), which seem to perpetuate fear, the positive outcomes of mammography should be the major focus. For example, women who have had mammograms should talk about how having regular recommended mammograms gave them peace of mind regarding their health. Emphasis should be placed on mammography becoming part of a woman's healthy lifestyle.

In addition to focusing on attitudes, marketing strategies should also focus on people who might influence a woman's decision to obtain or not obtain a mammogram. In this population, for example, the physician and spouse were the most frequently mentioned persons who might influence a

woman's decision to obtain or not obtain a mammogram. Therefore, marketing strategies should be developed and targeted towards these influential people.

Based upon the data, it is apparent that women are intending to obtain a mammogram, but not on the Mobile Medical van. The Mobile Medical van does not seem to be an attractive option for many women on the UTK campus. Perhaps more information about the Mobile Medical Unit van needs to be disseminated to women on campus, and a stronger marketing campaign needs to be organized prior to the van's arrival on campus. It may also be advantageous to periodically bring the Mobile Medical onto the campus for various educational programs and "open houses", in which women receive orientation and educational sessions about the van.

Summary

An instrument designed to measure attitudes, subjective norms and intention related to participation in a mammography screening program was developed using responses from a group of women over age 40 from east Tennessee. The instrument was pilot tested using a sample of 25 women ages 35 and older at the University of Tennessee at Knoxville (UTK). Internal consistency was computed using Cronbach's alpha.

The reliability coefficients for the attitude and normative belief scales were .56 and .62, respectively.

The questionnaire was sent to a random sample of 298 women ages 40 and older on the UTK campus and 202 were completed and returned, resulting in a 68 percent return rate. A sample of nonrespondents were contacted in order to assess differences between those who responded to the questionnaire and those who did not. Based on descriptive statistics, there were no apparent differences between the two groups.

Multiple regression analyses were performed to test the theory of reasoned action. The statistical analyses revealed that the model (consisting of a subjective norm component and an attitude component) did not significantly predict intention to obtain a mammogram when the Mobile Medical Unit van was on campus in November 1989. However, the attitudinal component of the model was a significant predictor of a woman's intention to obtain a mammogram within the next two years.

Of the 38 women who reported that they intended to have a mammogram while the Mobile Medical van was on campus, 29.7 percent (11) actually went for a mammogram.

In the following chapter, the researcher's findings, conclusions and recommendations are stated as they relate to this chapter.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS,
AND RECOMMENDATIONS

Summary

This research was undertaken for the purpose of identifying and verifying factors that determine a woman's intention to participate in a mammography screening program. Ajzen and Fishbein's theory of reasoned action was used as the theoretical framework for this study. The study sought to address the following research questions:

1. What are the positive and negative consequences that women believe will occur as a result of participating in a mammography screening program?
2. What people or groups of people influence a woman's decision to participate or not participate in a mammography screening program?
3. Which component(s) of the model will significantly predict a woman's intention to participate in a mammography screening program?
4. What percentage of intenders participated in a mammography screening program in November 1989?
5. What are the differences between questionnaire respondents and nonrespondents?

6. What recommendations for health promotion and marketing can accrue from identifying significant factors related to participation in a mammography screening program?

Following the protocol for instrument development proposed by Ajzen and Fishbein, a questionnaire was designed to measure attitudes, subjective norms and intention related to participation in a mammography screening program. The initial instrument was pilot tested on a group of 24 women at the University of Tennessee, Knoxville. The instrument was then evaluated for internal consistency reliability using Cronbach's alpha.

The final instrument was sent to a random sample of 298 women ages 40 and older at the University of Tennessee, Knoxville. The return rate was 68 percent and the total number of questionnaires used for data analysis was 199.

A sample of randomly selected nonrespondents were telephoned and asked to respond to five questions related to mammography and two questions which ascertained demographic information. Data from the nonrespondents were then compared to data from respondents in order to determine if there were differences between the two groups.

Multiple regression analysis was used to predict intention and to test the theory of reasoned action. One regression equation was constructed to determine which variable(s)

were significant in predicting intention to obtain a mammogram when the Mobile Medical Unit van was on campus. A second regression equation was constructed to test which variable(s) were significant in predicting a woman's intention to obtain a mammogram within the next two years.

In order to verify intention to obtain a mammogram on the Mobile Medical van, identification numbers of women who "intended" to have a mammogram on the van and those who actually went for a mammogram were matched. The percentage of "intenders" who actually went for a mammogram on the Mobile Medical van was used to verify intention.

Findings

Based on the data analyses, the following major findings were revealed:

1. Women reported that the advantages of mammography were that it detects lumps and cancer early, decreases anxiety about the development of breast cancer, and results in earlier treatment of breast cancer if a lump is found. Women listed that the disadvantages of mammography were that it costs too much, makes them fearful that a lump might be found, may be painful, will cause cancer, only benefits

women over age 65, is embarrassing to have a mammogram, and is time consuming.

2. Women reported that the following people might influence her decision to obtain or not obtain a mammogram: physician, spouse/significant other, parents or other close relatives, friends, and children.
3. With regard to intention to obtain a mammogram on the Mobile Medical van, neither attitude nor subjective norm significantly predicted intention to obtain a mammogram. Nonsignificance may be due to restriction of range.
4. With regard to intention to obtain a mammogram within the next two years, both attitude and subjective norm together in the equation significantly predicted intention and accounted for 27 percent of the variance. Attitude alone was a significant predictor of intention over and above subjective norm, while subjective norm was not a significant predictor over and above attitude.
5. Thirty-eight of 198 respondents reported that they intended to obtain a mammogram while the Mobile Medical van was on campus. The percentage of intenders who actually obtained a mammogram on the van was 29.7 percent (11).

6. Based upon a telephone follow-up of a sample of 19 nonrespondents (19), and a comparison of those who responded to the questionnaire and those who did not, it was determined that there were no differences among questionnaire respondents and nonrespondents.
7. Because a small number of women (19 percent, 38) reported that they intended to go to the Mobile Medical van for a mammogram, perhaps a stronger marketing/health promotion campaign needs to be developed in order to attract more women to the Mobile van.

Conclusions

Based upon the findings stated in the previous section, the following major conclusions were reached:

1. In general, women's responses to the advantages and disadvantages of mammography are consistent with a similar survey in Houston, Texas conducted by Pritchard, Jones, Bode, McDonald and Galik (1988).
2. Women's responses to the question regarding what people may influence their decisions regarding mammography are also consistent with the Houston survey (Pritchard et al., 1988).

3. Fifty-one percent (100) of the respondents reported that they had obtained a mammogram within the last year, therefore, only 49.2 percent (97) of the respondents may have actually been eligible to have a mammogram on the Mobile Medical van.
4. With regard to the Mobile Medical Unit van from UTMCK, the theory of reasoned action failed to predict a woman's intention to obtain a mammogram.
5. With regard to intention to obtain a mammogram within the next two years, the attitudinal component of the model played a larger role than subjective norm in predicting intention. Therefore, marketing and health promotion should focus more on attitudes than on subjective norms. However, the subjective norm component should not be ignored.

Recommendations

Based on the research the following recommendations are presented:

1. Because only 19 percent of the respondents indicated that they intended to obtain a mammogram while the Mobile van was on campus, it would be advantageous to ask a series of qualitative questions under this

intention question in order to ascertain reasons they do not intend to have a mammogram on the van.

2. Many women indicated that they intended to have a mammogram, but not on the Mobile Medical van. A post card follow-up after a one year period and again after two years may result in a more accurate verification of intention to obtain a mammogram.
3. For future research, a more general intention question combined with the post card follow-up may yield more significant results in predicting intention.
4. From a marketing and health promotion standpoint it is recommended that emphasis be placed on the more positive aspects of having a mammogram rather than using fear as a motivator. For example, emphasize the importance of making mammography part of a healthy lifestyle and giving a woman piece of mind regarding her health.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE

BREAST CANCER DETECTION QUESTIONNAIRE

BIRTHDATE

____/____/____
MONTH/DAY/YEAR

1. I intend to obtain a mammogram when the U.T. Medical Center Mobile Mammography van is on campus in November
 unlikely/____/____/____/____/____/____/____/likely
 extremely/quite/slightly/neither/slightly/quite/extremely
2. Mammograms can detect lumps in the breast before they can be felt.
 unlikely/____/____/____/____/____/____/____/likely
 extremely/quite/slightly/neither/slightly/quite/extremely
3. For me, finding a lump in the breast before it can be felt is:
 good/____/____/____/____/____/____/____/bad
 extremely/quite/slightly/neither/slightly/quite/extremely
4. Mammography will detect breast cancer early.
 unlikely/____/____/____/____/____/____/____/likely
 extremely/quite/slightly/neither/slightly/quite/extremely
5. For me, early detection of breast cancer is:
 good/____/____/____/____/____/____/____/bad
 extremely/quite/slightly/neither/slightly/quite/extremely
6. Mammography will cause cancer.
 unlikely/____/____/____/____/____/____/____/likely
 extremely/quite/slightly/neither/slightly/quite/extremely
7. For me, developing breast cancer from mammography would be:
 good/____/____/____/____/____/____/____/bad
 extremely/quite/slightly/neither/slightly/quite/extremely

-
-
8. Having a mammogram will be painful.

unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

9. For me, pain that may occur while having a mammogram would be:

good/ _____ / _____ / _____ / _____ / _____ / _____ /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

10. Having a mammogram will cost too much.

unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

11. For me, the high cost of a mammogram is:

good/ _____ / _____ / _____ / _____ / _____ / _____ /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

12. Mammography will only benefit women over the age of 65.

unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

13. Waiting to have a mammogram until I am 65 years old is:

good/ _____ / _____ / _____ / _____ / _____ / _____ /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

14. Having a mammogram will be embarrassing.

unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

15. For me, embarrassment while having a mammogram would be:

good/ _____ / _____ / _____ / _____ / _____ / _____ /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

16. Some women do not have mammograms because they are afraid that a lump in the breast might be found.

unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

17. Not having a mammogram for fear that a lump might be found is:

good/ / / / / / /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

18. Having a mammogram will take too much time.

unlikely/ / / / / / /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

19. For me, taking the time to have a mammogram is:

good/ / / / / / /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

20. Having a mammogram will result in earlier treatment for breast cancer.

unlikely/ / / / / / /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

21. For me, early treatment of breast cancer is:

good/ / / / / / /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

22. Having a mammogram will decrease my anxiety about developing breast cancer.

unlikely/ / / / / / /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

23. Decreasing my anxiety about developing breast cancer is:

good/ / / / / / /bad
 extremely/quite/slightly/neither/slightly/quite/extremely

PART 2

The next set of questions asks you to rate whether or not you believe certain people would think you should or should not obtain a mammogram.

24. Do you currently have a spouse or boyfriend? (circle one) Yes No

IF NO, PLEASE SKIP TO QUESTION # 27

25. My spouse/boyfriend thinks I should have a mammogram.
 unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely
26. Generally speaking, I want to do what my spouse/boyfriend thinks I should do.
 unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely
27. Do you presently have a physician?(circle one) Yes No

IF NO, PLEASE SKIP TO QUESTION # 30

28. My physician thinks I should have a mammogram.
 unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely
29. Generally speaking, I want to do what my physician thinks I should do.
 unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely
30. My friends think I should have a mammogram.
 unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely
31. Generally speaking, I want to do what my friends think I should do.
 unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
 extremely/quite/slightly/neither/slightly/quite/extremely

- IF NO, PLEASE SKIP TO QUESTION # 35**

- IF NO, PLEASE SKIP TO QUESTION # 38.**

- unlikely/ _____ / _____ / _____ / _____ / _____ / _____ /likely
extremely/quite/slightly/neither/slightly/quite/extremely

-
38. Do you intend to have a mammogram within the next two years? (circle one) Yes No

IF YOU INTEND TO HAVE A MAMMOGRAM WITHIN THE NEXT TWO YEARS, PLEASE SKIP THE NEXT TWO QUESTIONS.

39. If you do not intend to have a mammogram within the next two years, please list reasons why you do not intend to do so: (PLEASE LIST AS MANY RESPONSES AS YOU WISH)

40. If you do not intend to have a mammogram in the next two years, please list factors that may change your mind about having a mammogram within the next two years. (PLEASE LIST AS MANY RESPONSES AS YOU WISH)

PLEASE HELP US BY PROVIDING THE FOLLOWING INFORMATION ABOUT YOURSELF ON THE NEXT PAGE:

-
-
41. Have you had a mammogram within the last year?(circle one) Yes No
42. Have you had breast cancer?(circle one) Yes No
43. Age:
44. Race:
45. Present marital status: (circle one)
- a. never married
 - b. married
 - c. divorced
 - d. separated
 - e. widowed
46. Education: (circle one)
- a. did not complete high school
 - b. high school diploma
 - c. Some college
 - d. diploma from technical school
 - e. college degree
 - f. some graduate school
 - g. graduate degree
47. Occupation: (teacher, secretary, professor, etc.)
48. Yearly household (family) income: (circle one)
- a. less than \$10,000
 - b. \$10,001-20,000
 - c. \$20,001-30,000
 - d. \$30,001-40,000
 - e. \$40,001-50,000
 - f. \$50,001-60,000
 - g. more than \$60,000

Thank you for completing the questionnaire!

APPENDIX B

COVER LETTER

I am currently conducting a research study on women's attitudes, beliefs and intentions related to participation in breast screening activities. Enclosed is a questionnaire that I am asking you to complete as part of this study. The questions are easy to answer and should not take more than about 15 minutes of your time. The results of the research project will be important in understanding why many women do not obtain recommended mammograms at regular intervals and to develop health promotion strategies that may encourage women to obtain recommended breast screenings.

There are no risks involved in the research study and participation is strictly voluntary. Furthermore, there are no penalties for not participating and you may withdraw from the research study at any time without penalty.

Responses to the questionnaire will remain anonymous and there is no way that you can be identified. To insure confidentiality, the data from the questionnaire will be coded in such a way that no participant can be identified. In order to further insure confidentiality, there is no informed consent for you to sign and date. Returning the completed questionnaire in the self-addressed, stamped envelope will be considered your consent to participate in the study.

Since a limited amount of these questionnaires are being sent to women on the University of Tennessee campus, your individual opinion is highly important to the success of this research project. Please return the completed questionnaire in the enclosed envelope within one week after you receive it.

If you have any questions regarding the research study, feel free to contact me at the address or phone number listed below.

Thank you for your cooperation.

Catherine Crooks

Catherine E. Crooks,
Principal Investigator
Department of Health, Leisure and Safety
University of Tennessee, Knoxville, TN 37996
(615) 974-5041

APPENDIX C

INSTRUCTIONS

1. Never put more than one "X" on each question.
2. Answer all of the items unless instructed to skip a section.
3. Please answer all questions as honestly as possible. Do not answer as you think you should; give your true opinion.
4. If the choices provided do not exactly represent how you feel, please choose the one that comes closest.

APPENDIX D

LETTER TO PILOT SAMPLE

Letter to Pilot Sample

Thank you for agreeing to participate in the pilot testing of a questionnaire on women's attitudes, beliefs and intentions related to participation in breast screening activities. There are three things that I would specifically like you to evaluate on the questionnaire: 1) Clarity of each question. For example, did you understand what the question was asking? 2) Readability of the questionnaire. Was the questionnaire easy to read or did it strain your eyes, etc.? 3) How long it took you to complete the questionnaire. Please enter your starting and ending time at the bottom of this page and return this page along with the questionnaire in the self-addressed, stamped envelope.

Please feel free to mark directly on the questionnaire, especially with regard to specific questions. Also, try and be as specific as possible about any difficulties you may have with the questions. Although I would like you to address the three areas listed above, any additional comments you wish to make would be appreciated.

EXAMPLE:

Unclear - Did NOT understand Question
 Question #13. Waiting to have a mammogram until I am 60 years old
 is:

If you have any questions or comments regarding the study, please feel free to contact me at the address or phone number listed on the following page.

Thank you,

Catherine Crooks

Catherine Crooks
 Principal Investigator

Start time _____ End time _____

Total time to complete _____

APPENDIX E

QUESTIONNAIRE FOR NONRESPONDENTS

Questionnaire for Follow-Up of Nonrespondents

Name:

1. Reason(s) for not responding:
2. Have you had a mammogram within the last year?
3. Do you intend to have a mammogram within the next two years?
4. What is your highest educational level?
 - a. Did not complete high school
 - b. High school diploma
 - c. Some college
 - d. Diploma from technical school
 - e. College diploma
 - f. Some graduate school
 - g. Graduate degree
5. What is your occupation?

APPENDIX F

EXAMPLES OF OCCUPATIONS CLASSIFIED AS "STAFF"

EXAMPLES OF OCCUPATIONS CLASSIFIED AS "STAFF"

Accountant
Advisor
Bookkeeper
Budget officer
Computer programmer
Cook
Coordinator of grants and contracts
Data entry operator
Editor
Financial aid specialist
Insurance clerk
Laboratory technician
Library assistant
Medical technologist
Payroll assistant
Policy researcher
Publisher
Registered dietitian
Registered nurse
Secretary (clerical and administrative)
Speech pathologist
Word processor

APPENDIX G
CORRELATION TABLE

Table G-1
Correlations Between Sociodemographic Variables and Intention,
Attitude, and Subjective Norm

Socio-demographic Variable	Intention to Obtain Mammogram on Mobile Medical Van	Intention to Obtain Mammogram Within the Next 2 Years	Attitude	Subjective Norm
Race	.05	.06	.18	.03
Marital status	.14	.07	-.14	.05
Education	-.17	.09	.11	-.34*
Occupation	.07	.03	-.08	.23
Income	-.09	-.32*	.02	-.14

*p < .05

VITA

Catherine Elizabeth Crooks was born on January 1, 1958, in Mesa, Arizona. She attended public schools in El Paso, Texas and graduated in 1976 from Burges High School in El Paso. After attending the University of Texas at El Paso for two years, she entered Baylor College of Dentistry in Dallas, Texas where she received the Bachelor of Science degree in Dental Hygiene.

Catherine practiced dental hygiene for several years before matriculating into the University of Houston/Baylor College of Medicine program in Allied Health Education. She received the Master of Education degree in Allied Health Education and Administration from The University of Houston/Baylor College of Medicine program in 1985. Subsequently, she worked as a health educator and research assistant at the DeBakey Heart Center and the Center for Cancer Control Research at Baylor College of Medicine and The Methodist Hospital in Houston, Texas. Her activities there included directing a school health cardiovascular prevention project in public schools, developing cancer prevention curriculum materials for medical students and assisting in numerous research endeavors related to cancer prevention.

She entered the doctoral program in Health Education at the University of Tennessee, Knoxville, in 1987. While

working on her doctorate, Catherine was a graduate teaching associate in the Department of Health, Leisure and Safety. She received the Doctor of Philosophy degree in Education with an emphasis in Health Education in May 1990.

In addition to her graduate studies and teaching position, Catherine served as a consultant for the development and implementation of a mobile cancer screening program at the University of Tennessee Medical Center at Knoxville. She has published several articles in the area of health promotion and cancer prevention.

She is a member of the American Alliance for Health, Physical Education, Recreation, and Dance and Eta Sigma Gamma, Alpha Mu Chapter.