THE IMPACT OF FRAMING ON THE PSYCHOLOGICAL CONSEQUENCES OF RECEIVING A FALSE POSITIVE MAMMOGRAM

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by

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ABSTRACT

The objective of this study was to examine the relationship between the initial interpretation of an abnormal mammogram and subsequent anxiety levels. The Cognitive-Rational Theory of Anxiety (Lazarus, 1991), the Heuristic Theory (Tversky & Kahneman, 1973) and Cioffi's (1991) model of Diagnostic Inference formed the theoretical framework from which this relationship was examined. A total of 29 women participated in this study. Prior to a breast biopsy, women were interviewed to determine how they interpreted their abnormal mammogram. State and trait anxiety along with emotional, social and physical functioning were assessed at this time utilizing a series of standardized tests. Approximately 7 weeks after the biopsy had been performed, subjects were re-interviewed to determine their reaction to their biopsy result. State and trait anxiety and emotional, social and physical functioning were again assessed. Overall, the majority of women experienced a decline in anxiety between the two study phases. Irrespective of study phase, women who either interpreted their mammogram abnormality as being indicative of breast cancer or suspended judgement on their cancer status experienced more anxiety than women who interpreted their abnormal mammogram as not being indicative of cancer. Women's initial perceptions of an abnormal mammogram are important antecedents of anxiety.

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This thesis is dedicated in loving memory of Cyril John Cook, who showed me how to find courage and inner strength in the face of adversity. This thesis is also dedicated to all those families whose lives have been touched by cancer.

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1.1 MAMMOGRAPHY: AN OVERVIEW

Mammography is a radiological technique that permits the identification of breast abnormalities that may prove to be malignant at a clinically undetectable stage. Currently, mammography screening programs are being established across the country. The aim of these screening programs is to reduce breast cancer mortality by detecting cancerous cells prior to symptom onset and to provide the appropriate treatment. Early studies indicated that screening programs contributed to a 30-40% reduction in breast cancer mortality among women aged 50-74 years (Cuckle, 1991). However, a recent study has called into question these findings (Wright & Mueller, 1995). Researchers are now trying to evaluate these screening programs in terms of both patient benefit and allocation of public health resources (Marteau, 1994; Wardle & Pope 1992; Wright & Mueller, 1995).

As with any diagnostic test, mammography is not 100% accurate. Approximately 5% of screening mammograms are initially positive/suspicious (Wright & Mueller, 1995). The psychological reaction to a suspicious mammogram finding is one aspect of mammography screening that requires further investigation. Women who have a suspicious mammogram are required to undergo a breast biopsy. The purpose of this biopsy is to determine if the abnormality is malignant (cancerous) or benign (non-cancerous). Studies examining the

psychological impact associated with a breast biopsy have consistently shown that women find undergoing the biopsy procedure a stressful experience (Hughson, Cooper, McArdle & Smith, 1988; MacFarlene & Sony, 1992; Scott, 1982). Women attending breast clinics exhibit higher levels of anxiety than women attending general surgical clinics. Furthermore, this elevation in anxiety persists among those women who are referred for a breast biopsy (Lee & Maguire, 1975). Prior to biopsy, women experience high levels of state anxiety and an impairment in their reasoning ability (Scott 1982). Anxiety also remains high while women await their biopsy report (MacFarlane & Sony 1992).

Approximately 80% of the women referred for a breast biopsy after receiving an abnormal mammogram have benign (non cancerous) masses (Wright & Mueller, 1995). This is referred to as a false positive. A false positive is defined as an abnormal/suspicious mammogram mass that is found to be benign upon biopsy or subsequent testing. Given this high proportion of false positives and the anxiety women experience as a result of their biopsy referral, identification of the medical advantages associated with early breast cancer detection must be weighed against the psychological impact of receiving a false positive result. The task of behavioural scientists in this debate will be to identify the response pattern associated with a false positive result and its impact on

subsequent behaviour and emotional state.

The purpose of this study is to examine the emotional response to a false positive mammogram. Specifically, how the initial interpretation of the mammogram influences the woman's subsequent emotional state will be investigated.

As stated previously, the aim of cancer screening is to reduce cancer mortality by detecting cancer or a predisposition to cancer prior to symptom onset. Early detection allows for medical intervention and treatment. However, health professionals are becoming sensitive to the fact that there are psychological costs associated with screening programs. When evaluating a screening program, evaluators need to be concerned with the cognitive, emotional and behavioural aspects associated with screening. Evaluation of these three components is crucial in the assessment of the program's success. This evaluation is imperative when researchers are examining the consequences of receiving a positive screening result that is found to be negative upon further testing (Marteau, 1992). Not until recently has the psychological component of screening programs been included within the evaluation process. In her review of psychology and screening, Marteau (1994) stated that the development and application of psychological models to this area may serve to increase the effectiveness of screening programs. Psychological theories may help to identify those individuals

who are most vulnerable to the psychological costs associated with screening (Wardle & Pope, 1992).

Behavioural scientists need to identify the factors that contribute to the anxiety associated with mammography and further diagnostic testing. Below, the studies that have examined the psychological effects associated with mammography screening are reviewed. The focus of this review is primarily on studies that have examined the psychological costs associated with receiving a false positive mammogram. The findings from these studies have been inconclusive. Further research is required in this area to determine what factors are contributing to these inconsistencies. Subsequently, possible mediating factors which may contribute to the discrepancies between these studies are presented. Specifically, the cognitive theories of anxiety and worry are applied to this area in an attempt to account for the variation in emotional response exhibited by women who receive a false positive diagnosis.

1.2 THE PSYCHOLOGICAL COSTS ASSOCIATED WITH BREAST CANCER SCREENING

Only recently have researchers become concerned with evaluating the psychological costs associated with breast cancer screening programs (Wardle & Pope, 1992). Many of these studies were conducted to assess the effects of a negative mammogram on subsequent breast cancer detection practices. This research question has typically been explored utilizing retrospective measures of change in breast self-examination frequency and current cancer fears. One of the first studies that examined the effects of attending a breast cancer screening program found that screening did not result in an increase in psychiatric morbidity (Dean, Roberts, French & Robinson, 1986). This study was carried out utilizing a sample of 132 women who had negative (normal) breast screening results. Women were excluded from this study if they had received a false positive result. Consequently, the findings from this study have limited generalizablity and can only be applied to women who initially receive a negative mammogram. These findings provide no information on the experiences of women who receive false positive results.

Recent studies that have examined the psychological effects associated with receiving a negative mammogram have included women who have received false positive results within their study samples. Bull and Campbell (1991) examined the

psychological impact of a breast screening program on women who received either a normal or a false positive mammogram. Participants completed a questionnaire that contained the Hospital Anxiety and Depression Scale (HAD) as well as self-report measures of breast cancer worries and frequency of breast self-examination. The questionnaire was completed either prior to screening or six weeks following screening. Women who completed the questionnaire following screening differed with respect to their initial mammogram result. One group consisted of women with normal mammograms, another group consisted of women who had suspicious mammograms that required special assessment (ultrasound, further radiology, or fine needle cytology) and the final group consisted of women who had an abnormal mammogram that required a biopsy. All women had masses/abnormalities that were eventually found to be benign. The researchers reported that attending the screening program served to heighten the participant's awareness of cancer, irrespective of their mammogram result. Psychological impairment was not detected in either women who initially received a negative mammogram or in women who required special assessment. However, psychological impairment was detected in women who required a breast biopsy. Ten percent of these women required professional counselling and psychological services. These women became cancer phobic and increased their frequency of breast self-examination. It appears that

the benign biopsy report did not help eliminate these women's fears. This study served to highlight that the psychological effects associated with a false positive are different from the psychological effects associated with an initially negative mammogram.

The findings from a recent study (Sutton, Saidi, Bickler & Hunter, 1995) designed to assess the effects of screening mammography on women who received a negative (normal) result further confirm the need to examine the psychological response of a false positive separately from the psychological response to an initially negative result. In this study, anxiety was measured at several key points in the screening process (prior to screening, at the screening clinic and nine months follow-up). Overall, women who received a negative result did not experience a significant elevation in anxiety. However, further analysis revealed that for a subgroup of women, those who received a false positive diagnosis, anxiety did increase. At nine months follow-up, these women reported that they had been extremely anxious at several points in the screening process. Anxiety was greatest for these women upon notification of their screening report. They also recalled that they were more anxious while at the clinic and during the time when they were awaiting notification of their biopsy report.

The studies previously cited were designed to assess the psychological costs and benefits associated with attending breast screening programs. Specifically, these studies were concerned with identifying the effects of screening on women who received a negative mammogram. In addition to their primary objective, these studies served to demonstrate that the emotional response to a negative mammogram differs from the emotional response to a false positive. The findings suggest that receiving an initial negative mammogram is not a distressing event. In contrast, women who experience a false positive diagnosis may be adversely affected by the screening process and may be at risk for experiencing psychiatric difficulties. This aspect of mammography testing cannot be overlooked. Several recent researchers have focused their attention on identifying and evaluating the psychological consequences of receiving a false positive result.

1.3 THE PSYCHOLOGICAL CONSEQUENCES ASSOCIATED WITH A FALSE POSITIVE

Baum (1989) evaluated the cost of benign breast disease from a patient's viewpoint. He identified the period prior to attending the clinic for further investigation and the period from scheduling the biopsy to receiving the pathology report as the most stressful time for patients. He stated that the greatest cost of mammography presented itself in terms of

patient anxiety and cancer fears. Devitt (1989) also described the anxiety experienced by women while they await their biopsy report as being extremely intense. Although examining the initial response to a false positive is important, researchers also need to be aware of any long-term consequences. Both Baum (1989) and Devitt (1989) focused on the initial rather than the long-term reactions of a false positive result. These studies helped to establish that anxiety increases following a biopsy referral. The question that arises from these findings is, how long does this anxiety persist?

One of the first studies conducted to address this question reported that women who received a false positive mammogram experienced an elevation in mammography related anxiety and breast cancer worries. This anxiety was evident three months after a diagnosis of breast cancer was ruled out and resulted in the impairment of the women's mood and functioning (Lerman, Trock, Rimer, Jepson, Brody & Boyce, 1991). These findings indicate that the distress associated with a false positive diagnosis is enduring. The benign biopsy report did not reduce anxiety. Women still remained uncertain over their mammography and biopsy results. This uncertainty resulted in anxiety.

Other researchers have found contradictory results. One study measured psychiatric morbidity using the 28-item General Health Questionnaire (GHQ-28). The study's sample consisted of women who were attending a routine breast cancer screening clinic, women attending a clinic for further investigation of an abnormal mammogram and women experiencing abnormal breast symptoms. The GHQ-28 was completed in the clinic and three months later in the individuals' homes. Initial anxiety levels were highest among women who were attending the clinic as a result of a mammogram abnormality. For women whose subsequent clinical investigation ruled out the possibility of breast cancer, anxiety levels returned to normal at three months follow-up (Ellman, Angeli, Christians, Moss, Chamberlain & Maguire, 1989). This finding suggests that the elevation in anxiety surrounding a suspicious mammogram is transient. It appears that anxiety dissipates after the biopsy rules out a cancer diagnosis. Unlike the women in the study by Lerman et al (1991), the women in this study seemed to be confident in their benign biopsy report. This confidence served to alleviate any uncertainty they initially felt about their mammogram abnormality and helped to reduce their anxiety.

A similar study was undertaken to assess the quality of life following a false positive mammogram (Gram, Lund & Slenker, 1990). Women who received a negative mammogram and women who received a false positive mammogram completed a postal questionnaire six months after their screening mammogram. Eighteen months after screening the same sample of women took part in an interview. The purpose of this interview was to assess the long-term impact of their mammography experience. Women with a false positive result had higher levels of breast cancer anxiety than those who had received a negative result. Six months after a diagnosis of breast cancer had been ruled out, 40% of the false positive group continued to exhibit a fear of breast cancer. This fear persisted and was still evident in 29% of these women 18 months after the mammography was performed. Five percent of these women recalled that their false positive was the worst thing that ever happened to them. Although the researchers concluded that the majority of women who receive a false positive do not experience a decline in their subsequent quality of life, a subset of women appeared to be adversely affected by this ordeal. Further research is required to clearly identify the characteristics of this subset of women.

There were certain problems in the design of the above study. Gram and colleagues (1990) identified the design of their questionnaire as a weakness. Although the questionnaire was intended to measure the stress women experienced due to their mammogram experience, the questionnaire items actually gauged attitudes toward longevity rather than the intended construct of anxiety. The use of such a measure to assess the construct under investigation, raises questions about the study's internal validity. If the researchers had chosen a more valid measure of anxiety, the pattern of results obtained might have been different. Further research with more appropriate measures is needed to address the original research question.

1.4 SUMMARY OF STUDIES REVIEWED

Based on the studies reviewed, no firm conclusion can be made with regard to the psychological consequences of receiving a false positive. Some of the discrepancies between studies can be explained by different research designs, methodologies and choice of measurement instruments. The majority of studies reviewed have employed retrospective designs or measures. There are several drawbacks associated with this type of research method. Sutton et al (1995) stated "...women's memories of the earlier stages of screening [are] tainted by their later experiences" (p.417). This statement

illustrates the major drawback associated with retrospective measurements. Recall of events may be biased by more recent events. At the time of mammography testing and prior to biopsy, women who were eventually diagnosed as false positive may not have been more anxious than those women who initially received a normal mammogram. When asked to recall these events, women who received a false positive may be unable to disassociate the actual anxiety that they experienced at that time from anxiety they experienced throughout the whole ordeal. If a prospective design had been employed anxiety could have been measured prior to biopsy. This would provide the researchers with an unbiased measure of anxiety at this stage of the mammography process.

Methodological and research design aside, cognitive theories of anxiety may shed some light on the inconsistencies in emotional responses to a false positive diagnosis. Previous research has demonstrated that cognitive theories are useful theoretical frameworks for studying the origins of emotions (Smith, Haynes, Lazarus & Pope, 1993). Cognitive theories have been applied to the areas of anxiety and worry. The research conducted in these areas utilizing cognitive theories will be reviewed in the next two sections. In the final section, the value of applying these cognitive theories to diagnostic testing will be presented. Specifically, this section will deal with how cognitive theories can facilitate

our understanding of the emotional reactions that arise as a consequence of mammography screening.

1.5 THE COGNITIVE-RATIONAL THEORY OF ANXIETY

Cognitions play an integral role in our response to life events. Our emotional reaction to any given situation is directly influenced by our cognitive interpretation of that situation. The cognitive-motivational theory proposed by Lazarus (1991) is one of several cognitive theories that attempts to explain the relationship between cognitions and emotions. The basic tenet of this theory is that cognitions are important antecedents of emotional responses. The emotional reaction to a given encounter is dependent upon the individual's evaluation of the encounter. The purpose of this evaluation is to determine the effect of the encounter on the individual's well-being. This is referred to as the appraisal process (Smith & Lazarus, 1990). Researchers adhering to the cognitive-motivational theory have shown that how an individual initially appraises the situation will greatly influence his/her subsequent emotional state (Gilovich 1990, Griffin, Dunning & Ross, 1990).

Within this theory, there are two types of cognitions important in the formation of emotions. They are referred to as knowledge and appraisal (Smith, Haynes, Lazarus & Pope, 1993). These two cognitions differ with respect to their

direct impact on the resultant emotion. Knowledge influences emotion indirectly. It refers to the individual's representation of the situation. This representation reflects the individual's beliefs or knowledge about what is happening. Once the representation (knowledge) is formed, it is appraised in terms of its significance for personal well-being (Smith & Lazarus, 1990). This latter process is referred to as the appraisal. The appraisal process is a subjective evaluation of the knowledge, which directly influences emotions. Consequently, two individuals could construe the same situation in a similar manner (agree on all the facts), but they may experience different emotions because they appraise the significance of these facts (knowledge) differently. For example, two individuals may both experience the death of a loved one. Both individuals will agree that this was an unpleasant experience. However, one of the two individuals may evaluate this situation in terms of a blessing. This individual may perceive death as ending their loved one's suffering. They may also perceive the individual as leading a full life. This type of appraisal may cause the individual to accept the death of the loved one and to move on with his/her own life. In contrast, the other individual may view this death in terms of a loss. This individual may focus on how much they miss the loved one and why this had to happen. This type of appraisal of death may result in feelings of

depression and anger. In the above scenario, the same situation was appraised differently and produced two different emotions in the different individuals. The above example demonstrates the subjective nature of the appraisal process. Although both the individuals agreed that the event was negative they differed in their appraisal of this negativity. The difference in the appraisal process led to the manifestation of two different emotions.

Once the appraisal process is complete, a "core relational theme" emerges. The core relational theme is a molar level of analysis that constitutes a summary of the person's relationship to the environment. This relationship is expressed in terms of either a harm or a benefit. For example, the emotion known as anxiety is produced from a core relational theme of an ambiguous danger. When an individual appraises a situation as being harmful or dangerous to his/her well-being, anxiety emerges. This core relational theme is a summative form of analysis and does not provide any details about the specific cognitive decisions that went into evaluating the situation as dangerous. When examining the etiology of emotions, it is important to consider the factors which contributed to this overall evaluation. For example, when studying the origin of anxiety, it is not sufficient to know that the individual appraised the situation as being potentially dangerous to his/her well-being. We need to be

cognizant of the specific factors that led the individual to appraise the situation in this manner. Therefore, it is necessary to supplement this level of analysis with a molecular form of analysis. A molecular level of analysis allows us to identify and examine the questions and responses that generated the core relational theme of a danger/threat.

Many researchers have applied the concepts of this theory to the area of anxiety. Cognitive-motivational theorists propose that "anxiety arises when existential meaning is disrupted or endangered as a result of physiological deficit, drugs, intrapsychic conflict and difficult-to-interpret events" (Lazarus, 1991, pg. 234). In order for anxiety to occur, the individual must perceive the event as being personally relevant and its outcome as being negative. The individual must sense that he/she has little control over when this event will happen and must have limited coping ability to deal with this event. This type of appraisal leads to the core relational theme of an ambiguous fear and invokes the emotion known as anxiety.

1.6 COGNITIVE THEORIES OF WORRY

Cognitive theories have also been utilized by researchers studying the etiology of worry. "Worry is a cognitive phenomenon, it is concerned with future events where there is uncertainty about the outcome, the future being thought about

is a negative one, and this is accompanied by feelings of anxiety" (MacLeod, Williams & Bekerian, 1991, pg.478). Worry is often referred to as the cognitive component of anxiety (Borkovec, Robinson, Pruzinsky & DePree, 1983). Consistent with cognitive-emotional theory of anxiety, an important component in the origin of worry is the individual's expectation that an aversive event will occur. Many researchers have utilized judgement theories and heuristic theories to explore this component of worry (Borkovec et al,1983; Smith et al,1993). According to the heuristic perspective, when an individual is faced with a unique life event, he/she creates a scenario (heuristic) of that event. How easily this scenario comes to mind will influence the individual's judgement of the event's likelihood.

The application of this theory to chronic worriers has shown that chronic worriers and non-worriers differ with respect to how they construe similar events (MacLeod et al, 1991). Chronic worriers have a tendency to create negative heuristics. They are able to generate numerous reasons to account for why a negative event will occur. In contrast, they are unable to generate reasons as to why a negative event will not occur. Why is it that chronic worriers experience this impairment in their cognitive abilities?

To answer this question, it is necessary to consider the salience of the existing heuristics. It has been proposed

that once a heuristic has been created for an event, it may impede the development of similar heuristics that lead to different outcomes (Tversky & Kahneman, 1973). Once negative heuristics are formed, they may act as filters and distort new information in a manner that is consistent with existing heuristics (Brokovec et al, 1983). Consequently, an individual may maintain that a negative event will occur even when conflicting information exists. The individual interprets this conflicting information in a manner that is consistent with the negative heuristic. The assimilation of information in accordance with the heuristic, helps the individual maintain the original heuristic.

1.7 COGNITIVE THEORIES & DIAGNOSTIC TESTING

As demonstrated thus far, cognitive theories have shown that when an individual evaluates a situation in terms of an "ambiguous threat" he/she experiences anxiety. Likewise, when an individual creates a negative heuristic for an event this heuristic may persist even in light of contradictory information. These cognitive theories may help us understand people's reaction to screening and diagnostic testing.

Cognitive theorists propose that emotional responses are the result of an individuals's subjective evaluation of the situation. The anxiety associated with an abnormal mammogram can be viewed within the context of the cognitive-rational

perspective. A woman who receives an abnormal mammogram, may perceive this diagnosis as a negative event that could be a sign of physical harm. Since further testing is required to determine if this abnormality is cancerous or not, the woman may be uncertain as to what this testing will reveal. This uncertainty would cause the women to focus on the question "Do I have breast cancer?" In terms of the cognitive motivational theory, some women may respond "no" to this question. This response set would not result in a core relational theme of an ambiguous threat and thus anxiety would not arise as a result of this type of appraisal. Alternatively, if the woman responded "yes" to this question, a core relational theme of a threat or danger would emerge. This individual would anticipate a diagnosis of cancer. This specific appraisal would result in a core relational theme that would cause the individual to experience anxiety over the upcoming biopsy. The cognitive-emotional theory is a plausible explanation for the initial anxiety associated with an abnormal mammogram and the biopsy procedure.

The next question that needs to be addressed is how does the cognitive-rational theory explain the variation individuals display in their adjustment to a false positive? To answer this question, it is important to remember that the appraisal process is dynamic not static. As knowledge in the environment changes, so will the appraisal. When women

receive their benign biopsy report, they gain new knowledge. This new knowledge can be used to rule out a diagnosis of cancer. However, recall that the appraisal process is subjective in nature. Different women may appraise their biopsy report differently. For example, one woman may perceive her benign biopsy as being free of cancer. This type of appraisal would result in relief. The woman would no longer fear that she had cancer. She would be certain that she was healthy. This type of appraisal would serve to eliminate the core relational theme of an ambiguous threat of a potential cancer diagnosis. In contrast, another woman who also receives a benign biopsy report may remain focused on the uncertainty that surrounded her original mammogram. She may evaluate her biopsy report in a manner that is not indicative of being healthy and free of cancer. This woman may question the accuracy of the biopsy report and remain convinced that she has cancer. Thus the core relational theme of an ambiguous threat would persist and anxiety would remain high.

The inconsistencies in the studies reviewed can also be accounted for in terms of the heuristic perspective. Initially, women who receive an abnormal mammogram may show variation in how they construe this event. Some women may create a predominantly negative heuristic of this event, which would lead them to conclude that they have breast cancer even before they have their biopsy. In contrast, other women may

create a less negative heuristic of the event and even suspend judgement of their cancer status until after they have received their biopsy report. These women may prefer to perceive themselves as being cancer free until otherwise informed. Consequently, these latter women will readily accept their benign biopsy results. The new knowledge contained within the biopsy report will be easily assimilated within their existing heuristic for the event. These women will experience no long term psychological effects from the experience. However, women who have created a negative heuristic for this event may not be able to readily accept their benign biopsy report. The negative heuristic that they have created may serve to distort the information contained in the biopsy report in a manner that is consistent with this pre-established heuristic. This distortion would lead them to lack confidence in their biopsy report. These women would maintain their belief that they have breast cancer even in light of their benign biopsy report. Consequently, these women would not experience a reduction in anxiety.

Cioffi (1991) incorporated features from the cognitive-rational theory and the heuristic theory to form a model used to explain framing effects in diagnostic inference. According to this model, any diagnostic test result is always judged relative to one's perceived health status. In other words, prior to receiving a test result, a person labels his/her

health status in terms of wellness or illness. The individual's hypothesis regarding his/her health status is confirmed when the diagnostic test results correspond to the initial hypothesis made. However, when test results do not confirm the individual's hypothesis, an uncomfortable situation exists. The individual lacks agreement between his/her perceived disease status and his/her actual disease status as reported by the diagnostic test. At this point, the individual does not readily abandon his/her previous disease status perception. The individual has created a heuristic for his/her diagnostic experience. The formation of this heuristic may distort the information contained in the diagnostic test in a manner that is consistent with the present heuristic. Since the diagnostic test result cannot be readily assimilated within the context of the present heuristic, the individual may display a lack of confidence in the diagnostic test results. This lack of confidence would motivate the individual to continually monitor his/her disease status. Such a situation is believed to result in the impairment of the individual's psychological well-being. For example, prior to diagnostic testing an individual could convince him/herself that he/she has cancer. This would result in the creation of a heuristic in which the individual would anticipate a diagnosis of cancer from the testing. Under these conditions, a diagnostic test result ruling out

the possibility of cancer would not alleviate the individual's fears. This diagnostic information contradicts the well-formed heuristic. In evaluating the diagnostic test, the individual may feel quite confident that their original heuristic was correct and that the diagnostic test is discrepant. The individual would continue to believe that he/she does have cancer and disregard their test report. This evaluative response would cause the individual to have a preoccupation with their health status and display anxiety over the continuing possibility of having cancer.

As stated previously, women who receive an abnormal mammogram may demonstrate variability in how they appraise and frame this diagnostic information. Prior to biopsy, women may perceive themselves as either having or not having breast cancer based on how they appraise their mammography result. In addition, other women may opt to suspend judgement on their cancer status until they have received notification of their biopsy report.

It is hypothesized that all women will experience elevated anxiety upon notification of an abnormal mammogram finding. This increase in anxiety is predicted to be associated with how the individual initially frames this diagnostic information. Women who appraise and frame this information as being either indicative of cancer or opt to suspend judgement will experience greater levels of anxiety

then women who appraise and frame this information as not being indicative of cancer.

In the case of women who perceive themselves as not having breast cancer, the negative biopsy report merely confirms their existing beliefs. Hence, agreement is maintained between the perceived disease status and the actual negative biopsy report. We would predict that these women would experience no psychological impairment.

Irrespective, however, of their negative biopsy report, women who perceived themselves as having cancer prior to their biopsy may not readily abandon their initial perception. These women will tend to call into question both their health status and their biopsy report. They will be less confident of their negative biopsy report and exhibit a tendency to focus on the uncertainty surrounding their mammography result. Consequently, these women would be expected to experience psychological impairment. Finally, the information contained in the negative biopsy result can neither be confirmed or rejected by those women who have suspended judgment. These women have not perceived themselves as having or not having cancer. The information contained in the negative biopsy result is predicted to be readily assimilated within the women's heuristic for this event. These women are also not expected to experience psychological impairment.

The purpose of this study is to describe and examine how women who have received an abnormal mammogram initially frame this event. Specifically, it is the intent to examine how this framing is associated with anxiety levels both prior to biopsy and subsequently after notification of the biopsy findings.

1.8 HYPOTHESES

1). Prior to biopsy, women who receive an abnormal mammogram will experience anxiety. The extent of this anxiety will be dependent upon how the individual initially interprets her mammogram abnormality. Specifically, women who initially interpret their mammogram abnormality as being indicative of cancer will experience more anxiety than women who interpret their mammogram abnormality as not being indicative of cancer. Women who opt to suspend judgement on their cancer status will also experience a higher level of anxiety when compared to women who interpret their mammogram abnormality as not being indicative of cancer.

2). The duration of this anxiety will be dependent upon how the individual initially interprets her mammogram abnormality. Specifically, women who initially interpret their mammogram abnormality as being indicative of cancer will still experience an elevation in anxiety even after they receive a benign biopsy report. Women who initially interpret their mammogram abnormality as not being indicative of cancer or opt to suspend judgement until notification of the biopsy result will experience a reduction in anxiety.

(2) METHOD

2.1 Design:

This is a quasi-experimental design. To test the hypotheses, a prospective longitudinal study was conducted. Anxiety was measured prior to biopsy and approximately six to eight weeks after the women had received a benign biopsy report. Structured interviews were conducted by the principal investigator one week prior to biopsy and six to thirteen weeks following notification of biopsy outcome. The purpose of the first interview was to describe how the women reacted to and initially framed their mammogram abnormality. The purpose of the second interview was to describe how the women reacted and subsequently interpreted their biopsy report.

This study was submitted to and approved by the Human Investigation Committee of Memorial University of Newfoundland. Following approval from this Committee, this study was further submitted to the Health Care Corporation of St.John's Medical Advisory Committee where approval was obtained to conduct this study at St.Clare's Mercy Hospital and the General Hospital, St. John's, Newfoundland.

2.2 Subjects:

A total of 52 women referred for a breast biopsy after receiving an abnormal mammogram result were invited to participate in the first phase of this study. Six women elected not to participate in this study. The first five women served in the pilot test condition. Three women in the pilot test condition had benign masses and two had malignancies. All subjects in the pilot condition were excluded from any further analysis.

Of the remaining 41 women, 35 received a benign biopsy report and 6 received a malignant biopsy report. Women who obtained a malignant biopsy report were excluded from the second phase of this study. Of the women who received benign biopsy reports, 6 were not available to take part in the second phase of this study due to other commitments. Thus the final sample consisted of 29 women who received a false positive mammogram result. Table 1 contains the demographic data for this sample and the subject's reasoning behind having had a mammogram.

Insert Table 1 Here

As can be see from Table 1, the majority of subjects were married, had received some post secondary education and lived within the St.John's region. The mean age of subjects was 49,

with the ages ranging from 37 to 72. Most women had had a mammogram before. The average number of prior mammograms was 3. Approximately one half of the sample were sent for their most recent mammogram as a routine measure. All subjects reported that they would have a mammogram in the future.

2.3 Measures:

Dependent Measures

Level of Anxiety. The 40-item Spielberger State-Trait Anxiety Inventory (STAI) developed by Spielberger (1983) was used to measure anxiety. The STAI has been widely used to assess anxiety experienced by women who have either undergone or who are about to undergo breast biopsies (Millar, Jelicic, Bonke & Asbury, 1995; Scott, 1983; & Sutton et al, 1995). The STAI consists of two-sub-scales of twenty items each. The state sub-scale measures the current level of transitory anxiety and has been shown to be sensitive to situational stress. The instructions on the state sub-scale can be modified to measure anxiety associated with specific events (Spielberger, 1983). For the purpose of this study, the instructions on the state sub-scale were modified to measure the anxiety that was being experienced since the women had received notification of their mammogram abnormality and subsequently after they had received notification of their benign biopsy result. The trait sub-scale of the STAI

measures the individuals' general level of anxiety. For each of these sub-scales, items are evaluated using a four-point Likert scale.

Psychological Consequences of Screening Mammography Questionnaire (PCQ) Revised. The PCQ was developed by Cockburn, De Luise, Hurley & Clover (1992). Its intended use is to assess the effects of mammography on the participants' emotional, social and physical functioning. This measure has been shown to have content, discriminant, concurrent and construct validity. Furthermore, the subscales have high internal consistency (emotional subscale; r=.89; physical subscale, r=.77; social subscale, r=.78) (Cockburn et al, 1992). Responses are made using a Likert scale (0-3). This questionnaire was revised to examine the effects associated with receiving an abnormal mammogram and a subsequent benign biopsy report (Appendix).

Structured Interviews:

Structured Interview. All subjects were interviewed approximately one week prior to their scheduled biopsy procedure. The purpose of this interview was to describe the subjects' reaction to their mammogram abnormality and to determine how the women interpreted and framed (I have cancer, I do not have cancer, or suspended judgement) this

abnormality. The questions employed in this first interview are contained in the Appendix.

A second interview occurred approximately six weeks after the women were notified of their biopsy report. Due to this study's focus, only women who received a benign biopsy report participated in this second interview. The questions administered in this interview are presented in the Appendix. These questions were designed to assess how the women reacted to and interpreted their biopsy reports.

2.4 Procedure:

Phase 1 (pre-biopsy). This study included all women referred for a breast biopsy following an abnormal mammogram at either of the hospitals during the period of October 1995 to April 1996. Women were invited to participate in this study by the surgical clinic staff. All women were informed that a study was being conducted to examine the effects of having an abnormal mammogram and subsequent breast biopsy. Women who were interested in participating in this study met with the principal investigator. The principal investigator then explained in greater detail the purpose of the study. The women were informed that the purpose of this study was to examine the effects of receiving a benign biopsy result after having an abnormal mammogram. The women were informed that if they received a benign biopsy report, they would be asked to

take part in a second interview. They were also told that they could decline to take part in this second interview if they so desired.

Consenting participants were required to sign a standard consent form (Appendix). Of the interviews that were conducted, 23 (79%) were conducted in the pre-admissions clinic and 6 (21%) were conducted in the subjects' homes.

Prior to biopsy, participants completed the state and then the trait sub-scale of the STAI. Spielberger (1983) recommends this order of administration when both subscales are used. The state subscale was designed to be sensitive to the present emotional climate. In contrast, the trait sub-scale has been found to be unaffected by the current emotional climate. Giving the state-sub-scale first avoids the possibility that completion of the trait subscale may alter the emotional climate and thus influence the subject's response to the state subscale items. The instructions on the state sub-scale were modified to assess the anxiety that was being experienced after receiving notification of a mammogram abnormality. Participants also completed the first section of the PCQ (revised). After completion of these two measures, participants were interviewed by the investigator, employing the questions outlined in the Appendix. The purpose of this interview was to assess and describe how the women reacted to and interpreted their mammogram report.

Phase 2 (Post-biopsy). The purpose of this study was to assess the relationship between the initial framing of a suspicious mammogram and subsequent distress in women who received a false positive diagnosis. Therefore upon biopsy, women who were diagnosed as having cancer were excluded from this study. Women who received a benign biopsy report were classified as receiving a false positive diagnosis. These women were contacted approximately six weeks after they had been notified of their biopsy report. Six to eight weeks has been shown to be the period during which an acute crisis is usually resolved (Bloom, 1963; Lewis, Gottesman & Gustein, 1979). The second phase took place between 6-13 weeks after the subjects had been notified of their biopsy findings. The mean time period was 7 weeks.

Of the second interviews conducted, 18 (62%) were conducted in the subjects' homes and 11 (38%) were conducted at the Health Sciences Centre.

During this second interview, women completed the state followed by the trait sub-scale of the STAI. The instructions on the state sub-scale were again modified to assess the anxiety the women were experiencing since they received notification of their benign biopsy report. The final section of the PCQ (revised) was also completed during this interview.

After the completion of these measures, participants were interviewed by the investigator. The aims of this second

interview were: to describe how the women reacted to their biopsy report, to determine how they interpreted this report, and to identify the long-term psychological effects associated with receiving a false positive.

The items contained in both the first and second interviews were pre-tested. With respect to the first interview items, the first four subjects interviewed served in the pilot test condition. The women completed the interview and questionnaires. Based on these subjects' comments, the instructions were modified and certain interview questions were reworded. Only four subjects served in the pilot test condition because once these modifications were made, none of the remaining subjects experienced any major difficulties with either the interview items or the instructions.

Two of the subjects in the piloting condition had masses that were found to be malignant upon biopsy. The remaining two had benign masses. The two subjects who had benign masses, along with one other subject who had a benign mass, served in the piloting condition for the second phase of this study. The items and instructions pertaining to the second interview were piloted in the same manner as previously outlined for the first interview. Only three subjects were necessary to remove ambiguities in the interview items. All subjects who served in the pilot test condition were excluded from further analysis.

2.5 Analysis

All interviews were tape recorded and later transcribed. The information contained in the interviews was analyzed to describe and determine how the women initially interpreted their suspicious mammogram and their subsequent benign biopsy report. Typical views expressed by the women were extracted from the interviews and are introduced in the text of the results section.

The content of the interviews was analyzed by two independent raters. Based on this analysis, women were classified into one of the three framing categories previously outlined. When categorization could not be agreed upon by the two raters, the interview transcripts were given to a third rater who made the final decision.

Statistical analysis was performed to determine the relationship between framing and anxiety levels for both study phases utilizing a series of statistical tests. The mean state and trait anxiety scores were also calculated for both study phases for each of the three framing categories.

State and trait anxiety scores were calculated for each subject. These scores were compared with the age appropriate normative mean for each subject (Spielberger, 1983). Subjects whose scores on either the state or trait subscale were one standard deviation above the mean were classified as experiencing high anxiety. This procedure was conducted to

determine if women who received an abnormal mammogram experienced higher levels of anxiety than normal.

A oneway analysis of variance was also employed utilizing the state anxiety scores to determine if subjects classified in the three framing categories differed with respect to anxiety levels. When this analysis was found to be significant, a series of planned comparisons were performed to determine where this difference occurred. This analysis was repeated utilizing the trait anxiety scores. This analysis was carried out for the data collected during phase 1.

Means and standard deviations were calculated for the three sub-scales of the PCQ (revised). The proportion of women in each of the three framing categories in agreement with each of the PCQ (revised) items was also calculated. The purpose of this calculation was to determine if there was a difference in response pattern between the three framing categories. Chi square statistics were used to determine if there was a significant difference. This analysis was carried out separately for both study phases.

Paired t-tests were utilized to determine if there was a significant difference in anxiety levels between the two study phases.

Multivariate analysis of variance was used to determine if there was an interaction between framing and anxiety levels. If the main effects were found to be statistically

significant and no significant interaction effects were observed, a series of planned comparisons would be carried out to determine the full relationship between anxiety and framing.

RESULTS

3.1 PHASE 1 (PRE-BIOPSY) FINDINGS

3.1a Reaction and framing of the mammogram abnormality.

One of the aims behind the first interview was to describe the subjects' reaction to their mammogram abnormality. Both the subjects' initial and present reaction to their mammogram abnormality was used to classify subjects as interpreting their mammogram abnormality as being indicative of cancer, not indicative of cancer or suspending judgement regarding their cancer status.

Upon receiving their mammogram report, many subjects initially felt a variety of emotions. Typical reactions to the mammogram findings included:

> "I was panicky, a bit, you know what I mean, not outside, but you're sitting there and everything is going through your mind..."

> "I couldn't think...the first thing that comes to your mind is cancer,lumps...whatever...and people that you know that have died and that have cancer."

> "May be, may be, there is a chance it may be cancerous, but I am trying not to jump the gun."

> "Um...I was a little bit worried, not too worried."

Common reactions to the mammogram findings are presented in Table 2. In general, these comments were indicative of anxiety.

Insert Table 2 Here

In addition to their initial thoughts, subjects were asked what they thought about their mammogram at this point in time. Some typical responses to this question included the following:

> "Right now I am a little more optimistic about it. I am hoping that it is going to turn out okay. I have been told that 90% or 90 plus percent of these are benign so I am a little optimistic, but yet a little...a little...ah tormented about it so."

> "Well, to tell you the truth, at the time I thought...it was a cyst because I was after having one there before. It was the same type, but then it started getting larger and I said...(pause)...it could be anything. Who knows what it could be!"

Based on their responses to these interview questions, subjects were classified as either perceiving themselves as having breast cancer, not having breast cancer, or suspending

judgement on the presence or absence of breast cancer. The inter-rater agreement was 83%. The number of subjects classified into each of these categories is presented in Table 3.

Insert Table 3 Here

As can be seen from Table 3, 60% of the subjects were classified as suspending judgement on their cancer status. Less than one half of the sample were classified as firmly interpreting their mammogram abnormality as being either indicative or not indicative of cancer.

The minority of subjects who felt that they either had or did not have breast cancer were more firm in their responses to the questions asked during the first interview than women who were classified as suspending judgement. For example one subject who was classified as interpreting her mammogram abnormality as not being cancerous said:

> " Well, I feel, right now, that there is no need to worry. That I am almost sure that if there is something there it is benign and not malignant."

Similarly, another subject classified as interpreting her mammogram abnormality as not being indicative of cancer said:

" I'm not worried about the cancer bit at all! I don't think there is any cancer there. I'd be some shocked if there was."

A subject classified as perceiving herself as having cancer said:

"...you sit in the bath and everything is quiet and you lie back and think, is this my last year...its frightening...there are so many people dying of cancer...if it is so curable, where are all these people going?"

In contrast, subjects who were classified as suspending judgement, communicated during the interview that they were optimistic, or hoping that it was not cancerous. They were less sure of their feelings than subjects in the other two categories. Typical responses made by subjects who were classified as suspending judgement included:

"I'm still a little worried about it, because, really, he (the surgeon) won't know for sure until he does the biopsy."

"...there is a difference between what your brain thinks and what your stomach thinks, and so part of me worries (about cancer) and the intellectual part of me says that I shouldn't worry."

"I have mixed emotions. Very much so, because until the doctor tells me its okay I won't be content."

"I've been a bit,...what?... ambivalent, I guess. I have been kind of up and down and back and forth a number of times about it. I know the statistics are very good, in my favour. And uh there are really a lot of positive things about it. But until you get it all done, and copper fastened and someone saying, "you're fine", there is that...nag, so...I don't know, I guess (pause) I guess I am somewhat worried, but with all kinds of reasons not to be. So I think it more my sub-conscious than anything."

All subjects regarded the biopsy as the means to determine once and for all if the lump was malignant or benign. As one subject put it:

"I am having the biopsy done because if I don't go through with it, it will always be sifting through my mind..."

3.1b The relationship between framing and anxiety levels.

The state and trait anxiety scores were calculated for each subject. Both the state and the trait scores for each subject were compared with their age appropriate norms (Spielberger, 1983). Subjects were classified as experiencing high anxiety if their scores were one standard deviation above their age appropriate mean. The data for state anxiety are presented in Table 4 by framing category.

Insert Table 4 Here

As can be seen from Table 4, 72.4% of the sample experienced higher than average levels of anxiety. This finding lends support to the hypothesis that prior to biopsy, women who receive an abnormal mammogram experience a heightened level of anxiety.

All subjects classified as perceiving themselves as having cancer and 77.8% of subjects who were classified as suspending judgement had levels of anxiety that were higher than their age appropriate norms. In contrast, only one half of the subjects classified as perceiving themselves as not having breast cancer experienced a heightened level of anxiety.

Comparison of the subjects' trait anxiety scores with their age appropriate means revealed that only three subjects exhibited trait anxiety scores that were one standard deviation above their age appropriate mean. Two of these subjects were classified as suspending judgement and the other subject was classified as perceiving herself as not having breast cancer.

The mean state and trait anxiety scores and standard deviations were calculated for each of the three framing categories. These data are presented in Table 5.

Insert Table 5 Here

A oneway analysis of variance was performed using the state scores. This analysis revealed that there was a significant relationship between framing and level of anxiety ($F=4.86$, $df=2,26$, $p < .05$). Subjects classified as either suspending judgement or perceiving themselves as having cancer had higher levels of anxiety than subjects classified as perceiving themselves as not having cancer ($t(26)=-3.08$, $p < .01$). Subjects classified as either suspending judgement or perceiving themselves as having cancer did not differ from one another with respect to anxiety levels ($t(26)=-1.01$, $p > .05$).

This analysis supports the hypothesis that prior to biopsy, women who opt to suspend judgement or perceive themselves as having cancer experience higher levels of anxiety than women who perceive themselves as not having cancer.

A oneway analysis of variance was performed using the trait scores. This analysis was performed to determine whether there was a relationship between trait anxiety and framing. No statistical difference between the framing categories was detected ($F=.439$, $df = 2,26$, $p > .05$).

The PCQ (revised) was utilized to assess the subjects' emotional, social and physical functioning. Table 6 shows the means and standard deviations for each of these subscales by framing category.

Insert Table 6 Here

A oneway analysis performed on these data found that there was no significant framing effect for either the social ($F=3.13$, $df=2,26$, $p > .05$) or physical ($F=3.23$, $df=2,26$, $p > .05$) subscales. However, a significant framing effect was detected for the emotional subscale ($F=3.40$, $df=2,26$, $p < .05$). Subjects who were classified as perceiving themselves as not having cancer reported less emotional upset than subjects who were classified as perceiving themselves as

either having cancer or suspending judgement ($t(26)=-2.60$, $p < .05$). The subjects in the later two categories did not differ from one another with respect to emotional upset ($t(26)=-1.35$, $p > .05$). This demonstrates that there is a relationship between initial framing of a mammogram abnormality and the level of emotional functioning prior to biopsy.

To examine in greater detail the relationship between framing and emotional functioning, each of the PCQ (revised) items was examined. For the purposes of this analysis, the responses of subjects who either interpreted their mammogram abnormality as being indicative of cancer or suspended judgement were compared with subjects who interpreted their result as not being indicative of cancer. This classification scheme was employed because the difference in the mean scores on each of the sub-scales between the suspended judgement subjects and the subjects classified as perceiving themselves as having cancer was found to be non-significant. The results of this analysis are presented in Table 7.

Insert Table 7 Here

As can be seen in Table 7, subjects in the two categories differed with respect to four of the twelve items. In contrast to subjects classified as perceiving themselves as

not having cancer, subjects classified as either suspending judgement or perceiving themselves as not having cancer were more unhappy or depressed ($X^2(1,29)=5.66, p < .05$), more scared and panicky ($X^2(1,29)=5.66, p < .05$), were keeping more things from those close to them ($X^2(1,29)=5.66, p < .05$) and felt more worried about their future ($X^2(1,29)=3.84, p < .05$).

3.2 POST-BIOPSY FINDINGS

3.2a Reaction to the biopsy experience and findings.

Subjects were asked how they had been feeling since they received their biopsy results. The responses to this question were coded into three mutually exclusive categories. Subjects who reported no problems or difficulties were assigned to the fine/great category. Other subjects reported that they were feeling fine, but they were experiencing some physical problems. These types of problems included; a longer recovery period than they had expected, a larger incision and scar than had expected, and the development of infections. Subjects who expressed these complaints were assigned to the physical complaint category. Finally, subjects who expressed worry or concern over their mammogram and or biopsy result were assigned to the still worrying category. Classification was done by two independent raters. Inter-rater agreement was 100%. The proportion of subjects assigned to each of these categories is presented in Table 8 by framing category.

Insert Table 8 Here

As can be seen in Table 8, the three subjects classified as perceiving themselves as having cancer prior to the biopsy, were still expressing either physical complaints or worries. For example one of these subjects reported:

> "I still think I am going to get bad news...I still think there is something there."

Another reported:

> "Well, generally, I'm still sceptical about...it's still in the back of my mind, well maybe another one is going to pop up."

In contrast, approximately 78% of the subjects classified as suspending judgement and 75% of the subjects classified as perceiving themselves as not having cancer reported no major concerns or worries.

Subjects' reactions to their biopsy results were also assessed. The reactions were coded as either positive or negative. A reaction was classified as being positive if the subject indicated relief, joy or happiness in her response.

In contrast, if the subject exhibited concern and worry over the findings of the biopsy, the reaction was classified as being negative. Classification was done by two independent raters. Inter-rater agreement was 100%. The proportion of subjects assigned to each of these categories is presented in Table 9 by framing category.

Insert Table 9 Here

As can be seen from Table 9, 86.3% of the subjects were classified as exhibiting a positive reaction to their biopsy report. Of the 13.7% of the sample classified as exhibiting a negative reaction, one half of these subjects were initially classified as perceiving themselves as having breast cancer.

The level of stress assigned to receiving a mammogram abnormality and a subsequent biopsy was evaluated. Subjects were asked to rate this event in terms of other stressful experiences they have had to endure. The responses to this question are presented in Table 10 by framing category.

Insert Table 10 Here

All subjects classified as perceiving themselves as having cancer rated this event as the most stressful event that they had experienced to date. Of the subjects classified

as not perceiving themselves as having cancer, 63% rated the event as either being least stressful or on par with other stressful events in their lives. Subjects in the suspended judgement category were less uniform in their responses to this question. Some of these subjects did not directly answer the question and attempted to answer the question by comparing this event with other specific events. For example:

> "I would say probably more stressful then the everyday stuff...a death in the family or something like that...that would probably be comparable, but in a different way...that is a different kind of stress than this..."

This type of response was classified as a comparison.

Subjects were also asked if they had any further concerns about either their mammogram or biopsy results. Subjects were classified as either being content with the findings, not content or having mixed emotions about the findings. The proportion of subjects assigned to each of these categories is displayed in Table 11 by framing category.

Insert Table 11 Here

Overall, 20.7% of the subjects expressed either further concern or mixed emotions over their mammogram and biopsy results. Of this 20.7%, two of these subjects were classified as perceiving themselves as having cancer. Both of these subjects felt that they had not been given enough information or a lengthy enough explanation about what had happened. For example one of these subjects reported:

> "I would like to see the full report...to give you full knowledge of what was going on...I don't know what I have, what caused it...I didn't get anything answered really!"

Of the remaining subjects classified as not being content with their mammogram or biopsy findings, one subject was classified as perceiving herself as not having cancer. This subject reported that she was feeling fine since notification of her biopsy result, but she still had some mixed feelings about the outcome:

> "I've had no problems. Just sometimes, like, I will think about it and wonder, you know, you say to yourself, you were lucky, there was no cancer, but are you sure that there is no cancer, or in a year or two years time will it be cancer? Will they find something else and will it be cancer?"

The remaining three subjects still not content with the findings were classified as suspending judgement and voiced similar concerns as the subjects previously cited.

3.2b The relationship between framing and anxiety levels.

A paired t-test was performed to determine whether subjects experienced a reduction in anxiety after learning of their biopsy result. In this analysis the state anxiety score obtained during the pre-biopsy phase was compared with the state anxiety score obtained during the post-biopsy phase. This analysis revealed that there was a decline in anxiety between the two phases ($t(28)=6.82$, $p < .001$).

The findings from this analysis support the hypothesis that women experience a reduction in anxiety after receiving notification of their benign biopsy findings.

Similarly, subjects completed the trait anxiety subscale during the post-biopsy phase. The paired t-test performed on this data revealed that their was no statistically significant difference between the pre and post biopsy scores ($t(28)=1.19$, $p > .05$). The pre and post biopsy means and standard deviations for both these subscales are presented in Table 12.

Insert Table 12 Here

The state scores for each of the subjects were again compared with the subjects' age appropriate mean. Subjects were again classified as having heightened anxiety levels if their scores were one standard deviation above their age appropriate mean. These data are presented in Table 13 by framing category.

Insert Table 13 Here

Of the sample, 20.7% were still classified as experiencing heightened levels of anxiety. Of these subjects, 83.3% were initially classified as perceiving themselves as either having cancer or suspending judgement. Only one of these subjects was originally classified as perceiving herself as not having breast cancer.

The interviews with the subjects who were classified as exhibiting heightened levels of anxiety were further analyzed. The purpose of this analysis was to identify any commonalities. This analysis revealed that 66.7% of these subjects still had to be monitored for breast cancer or they were diagnosed as having fibrocystic disease. Similarly, with the exception of one subject, all of these subjects indicated that they had a family history of breast cancer.

The three subjects identified as exhibiting high trait anxiety during phase one were also found to exhibit high trait anxiety at phase two. None of these three individuals was still exhibiting heightened state anxiety.

A multivariate analysis of variance was performed to determine whether there was a relationship between framing and levels of anxiety between the two phases. There was a significant decline in anxiety from phase one to phase two for the entire sample ($F=23.03$, $df = 1,26$ $p < .001$). A significant relationship was also detected between framing and level of anxiety irrespective of study phase ($F=3.80$, $df=2,26$ $p < .05$). No interaction effects were detected between anxiety levels and framing for either study phase ($F=1.02$, $df=2,26$ $p > .05$).

To examine in greater detail the relationship between framing and anxiety, the state anxiety scores obtained during phase 1 and phase 2 were averaged for each subject. The average of the two state scores was utilized in this analysis because no interaction between anxiety and framing was detected. The purpose in combining the two state scores was to determine how the subjects in each of the three categories differed with respect to anxiety.

A series of planned comparisons were conducted to examine the full extent of the relationship between the framing categories and anxiety. This analysis revealed that subjects

classified as either suspending judgement or perceiving themselves as having breast cancer experienced higher levels of anxiety than women who were classified as perceiving themselves as not having breast cancer ($t(26)=-2.74$, $p < .01$). Subjects classified as either suspending judgement or perceiving themselves as not having cancer did not differ in terms of anxiety ($t(26)=-1.57$, $p > .05$).

This supports the hypothesis that there is a relationship between post-biopsy anxiety levels and pre-biopsy framing.

The second portion of the PCQ (revised) was administered during interview 2. During the administration process, several subjects indicated that certain items were not applicable to their experience. Table 14 contains the proportion of subjects in each framing category that felt that certain individual items were not applicable to their experience.

As was done in the first phase of this study, the subjects who were classified as perceiving themselves as having cancer were combined with the suspended judgement category. This was done due to similarity in mean anxiety levels between the two categories and the small proportion of subjects thought to perceive themselves as having cancer.

Insert Table 14 Here

Slightly more than one half of the sample reported that relationships with family and friends and their ability to get along with those around them was not affected by this experience. Approximately one half of the sample reported that this experience did not impair their ability to do the things they normally did or their ability to meet their home or work responsibilities. Chi square tests were performed for each item to determine if the subjects in the framing categories differed with respect to the appropriateness of the item to the experience. No statistically significant differences were detected.

Due to the high proportion of subjects who reported that many of the PCQ (revised) items were not applicable to their experience, the mean scores for the emotional, physical and social sub-scales were not computed. This analysis was omitted because the calculation of these means using only part of the sample would not accurately reflect the sample as a whole.

Nonetheless, the proportion of subjects in each of the framing categories who agreed with each of the PCQ (revised) items was assessed. The proportion of women agreeing with each of these items is presented in Table 15 by framing category.

Insert Table 15 Here

Overall, 82.8% of the sample had greater confidence that they did not have breast cancer and reported that they were feeling more relaxed since receiving their biopsy report. Approximately 70% of the overall sample were feeling more hopeful about their future and felt less anxious about breast cancer. Finally, 65.5% reported a greater sense of well being. Chi square tests were performed for each of the items. This analysis revealed no statistically significant difference between the framing categories for any of the items.

DISCUSSION

Previous research has produced inconclusive evidence regarding the anxiety surrounding a false positive diagnosis of breast cancer. Although previous researchers have shown that women experience an elevation in anxiety prior to receiving their biopsy result (Sutton et al, 1995), the findings regarding post-biopsy anxiety levels have been inconsistent. Some researchers have found that anxiety dissipates after women receive notification of their benign biopsy report (Ellman et al, 1989), while others have found that women still remain anxious after notification (Lerman et al, 1991).

In an attempt to account for these inconsistencies, the cognitive theories of anxiety were employed in this study. The three theories were; the cognitive-rational theory, the heuristic theory and Cioffi's (1991) model of diagnostic inference.

According to the cognitive-rational theory of anxiety, how an individual appraises a situation will determine how he/she will respond to that situation. Anxiety is thought to occur when an individual appraises a situation as being harmful or dangerous to his/her well-being (Smith & Lazarus, 1990).

Similarly, proponents of the heuristic theory suggest that anxiety occurs when individuals create negative scenarios

(heuristics) of events (Tversky & Kahneman, 1973). These negative scenarios act as filters and distort information in a manner that is consistent with the existing heuristic. The creation of a negative heuristic impedes the development of other heuristics in which a more positive outcome is likely.

Finally, Cioffi's (1991) model of diagnostic inference incorporates features of both the cognitive-rational theory and the heuristic theory. According to this model, prior to any diagnostic test an individual labels him/herself as either being well or ill. Diagnostic test results that confirm the individuals label are readily accepted. However, diagnostic test results that contradict the individual's label are not readily accepted. In the latter situation, the individual still maintains his/her previously held label and elects to call into question the diagnostic test findings. This situation causes the individual to remain in a state of uncertainty and anxiety.

The purpose of this study was to describe and examine the relationship between the framing of an abnormal mammogram and anxiety in women who receive a false positive diagnosis of breast cancer. Cioffi's (1991) model of diagnostic inference was utilized in this study to explain the relationship between women's initial reaction to their abnormal mammogram and anxiety both prior to and subsequent to the biopsy procedure.

In exploring this relationship, the first aim of this study was to examine how women initially interpreted and framed their abnormal mammogram finding. The association between framing and anxiety surrounding this event was then explored.

Women demonstrated variability in how they interpreted and framed their abnormal mammogram. Prior to biopsy, the majority of women opted to suspend judgement on their cancer status. Very few women would firmly state that they felt they had or they did not have breast cancer. The majority of women experienced heightened levels of state anxiety. The mean state anxiety score obtained during the first phase of this study was consistent with the means obtained in similar studies that have employed this measure of anxiety (Millar, et al, 1995; Scott, 1983).

As hypothesized, women classified as either suspending judgement or perceiving themselves as having breast cancer had higher anxiety levels when compared to women who were classified as perceiving themselves as not having breast cancer. Women who were classified as perceiving themselves as not having cancer also experienced less emotional upset than the women classified in the remaining two categories.

The second aim of this study was to describe women's reaction to a benign biopsy report. The association between framing and anxiety was again examined to determine the full

extent of this association.

During the second interview, the majority of women expressed relief and contentment with their biopsy findings. A reduction in state anxiety was observed between the two study phases. After notification of the benign biopsy report, the anxiety surrounding an abnormal mammogram appeared to dissipate for the majority of women. This finding is consistent with previous research (Ellman et al, 1989).

However, this did not hold true for a small proportion of the sample. Similar to the findings of Gram et al (1990), some women in the present study were still exhibiting worry and concern even after notification of a benign biopsy report. These women, as hypothesized, were originally classified as either perceiving themselves as having cancer or suspending judgement.

Subjects classified as perceiving themselves as having cancer and who were still not content after having the biopsy felt that they were not given enough information regarding their health status. Possibly the lack of information and knowledge led these subjects to form negative heuristics for this event. Possibly if they had felt that they had sufficient knowledge of what was happening or what had happened to them, they would have appraised the situation differently and framed their mammogram abnormality in a different manner. The function of knowledge and information

is an important aspect of the framing process that requires further exploration.

With the exception of one individual, women who were still experiencing higher than normal state anxiety during phase two of this study reported that they had a family history of breast cancer. This possibly contributed to the maintenance of these women's heightened anxiety levels at phase two. This information probably was of significance in the women's appraisal and heuristic formation of this event. Future research should examine the importance of familial history in the formation of heuristics and its role in framing.

A relationship between framing and anxiety was detected irrespective of study phase. This lends support to the main hypothesis tested in this study. Women who initially interpret their mammogram abnormality as being indicative of cancer experience higher levels of anxiety both prior to and subsequently after notification of a benign biopsy result. Although women who either suspend judgement or perceive themselves as not having cancer experience heightened anxiety prior to biopsy, this anxiety is not as severe. These women are also more likely to experience a reduction in anxiety after receiving notification of their biopsy findings.

In this study a relationship was observed between the framing of an abnormal mammogram finding and anxiety.

According to the cognitive theories of anxiety, how women interpret and frame their abnormal mammogram will have a direct effect on the level of anxiety associated with this event. However, the argument could be made for the reverse of this relationship. Some women may be normally anxious. These women may experience heightened levels of anxiety to most situations. It could be argued that for this sub-set of women that their predisposition towards anxiety may have caused them to frame their abnormal mammogram in terms of cancer.

To rule out this possible explanation, trait anxiety was measured during both of the study phases. Trait anxiety scores remained stable across the study phases. Comparison of the mean trait anxiety scores for each of the three framing categories also revealed no difference among the groups in either study phase. Thus women who were classified as perceiving themselves as having cancer did not exhibit a predisposition to anxiety.

Although the consistency of the trait anxiety scores among the framing categories serves to weaken the alternative explanation for the findings, it does not mean that the explanation put forth in this study can be readily accepted. Further research is required to establish the directionality of this relationship. Research utilizing intervention strategies aimed at identifying and altering women's cognitions of their abnormal mammogram findings are required

to further test the directionality of this relationship.

The majority of women who consented to participate were classified as suspending judgement. Very few of subjects were classified as perceiving themselves as having cancer. Although the response rate in this study was high, it is possible that those women who elected not to participate, differed from consenting participants with respect to how they framed their abnormal mammogram.

It is conceivable that women who opted not to participate in this study perceived themselves as having breast cancer and were experiencing high levels of anxiety. This high level of anxiety may have contributed to their decision not to volunteer to take part in this research study. These women may have decided not to participate because they may have perceived their involvement as an added stressor that they did not need. Trying to obtain 100% participation rate to rule out this possibility is difficult to achieve. This will be a major obstacle for future researchers to overcome.

The emotional, physical and social reactions to receiving a false positive diagnosis were examined during both study phases by framing category. These three reactions were examined utilizing the PCQ (revised). With the exception of emotional upset during phase one, no difference in reaction was observed between the three framing categories.

The PCQ was originally designed to measure the psychological consequences of attending a mammography screening program. Revising and utilizing the PCQ during phase one of this study seemed to be appropriate. However, utilization of the PCQ (revised) during phase two may not have been appropriate. Many women during phase two felt that the items contained on the PCQ (revised) did not accurately reflect how they were feeling. More qualitative research is needed to identify the long term psychological consequences of a false positive diagnosis of breast cancer. Based on the findings of this research, more precise measures can be designed for use with this population.

Due to this study's focus, women who received a malignant biopsy report were excluded from the second study phase. Future studies examining adjustment to breast cancer should consider the effects of framing to the adjustment process. Possibly women who receive a malignant biopsy result and who initially framed their abnormal mammogram as being indicative of cancer will exhibit better adjustment to their diagnosis. Similarly, women who opt to suspend judgement may also have an easier time accepting their diagnosis due to the weak heuristic that they decided to create for this event. Finally, women who framed their abnormal mammogram as not being indicative of cancer may find it difficult to adjust to their diagnosis. Possibly this latter group of women may even

question their biopsy result. Replication of this present study utilizing women who receive malignant biopsy reports is required to examine this relationship.

The findings from this study indicate that women do exhibit variation in how they interpret and frame an abnormal mammogram finding. This framing is associated with anxiety levels both prior to biopsy and subsequent to notification of the biopsy findings. Awareness of the framing effect will assist health care professionals to better understand those individuals who are experiencing high levels of anxiety. Intervention programs can be specifically designed to help women alter their cognitions and how they frame their mammogram abnormality in a way that minimizes the level of anxiety that the women will endure. The relationship between cognitions that produce negative emotional states is an area that needs further research. Knowledge of this relationship is important not only within the health care setting, but also in other aspects of daily living.

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APPENDIX

Table 1: Demographic characteristics of study sample.

	N (%)
MEAN AGE (yrs) ( ) = Range	49.17 (37 - 72)
MARITAL STATUS:	
Married	25 (86.2)
Single	2 (6.9)
Divorced	1 (3.4)
Widowed	1 (3.4)
EDUCATION:	
Grammar School	2 (6.9)
High School	8 (27.6)
Trade/Community College	10 (34.5)
University	9 (31.0)
RESIDENCE:	
Urban	27 (93.1)
Rural	2 (6.9)
PREVIOUS MAMMOGRAM:	
First mammogram	9 (31.0)
Had mammograms before	20 (69.0)
REASON FOR MAMMOGRAM:	
Routine check-up	15 (51.7)
A mass was detected	9 (31.0)
Family history of breast cancer	5 (17.2)
N	29 (100%)

Table 2: Common reactions to the initial mammogram report.

COMMON THEMES
Frightened, scared, worried, upset
Shock, hard to believe it was happening
Who knows what it could be, it could be anything
Thoughts of breast cancer & mastectomies
Thoughts of those you know who have/had cancer
Hesitation, unreal experience

Table 3: Framing categorization of subjects (pre-biopsy).

FRAMING	N (%)
I have cancer	3 (10.3)
Suspended judgement	18 (62.1)
I do not have cancer	8 (27.6)
TOTAL	29 (100)

NOTE: ( ) Proportion of Sample

Table 4: Proportion of subjects with high state anxiety by framing category (pre-biopsy).

	HIGH ANXIETY	N
I have cancer	100.0 (3)	3
Suspended judgement	77.8 (14)	18
I do not have cancer	50.0 (4)	8
TOTAL	72.4 (21)	29

Table 5: Mean state and trait anxiety scores by framing category (pre-biopsy).

FRAMING CATEGORY	STATE ANXIETY	TRAIT ANXIETY
I have cancer	58.33 (5.77)	33.00 (5.20)
Suspended judgement	52.11 (10.18)	36.00 (9.06)
I do not have cancer	40.88 (10.12)	32.88 (8.32)
TOTAL SAMPLE	**49.66 (11.17)**	**34.83 (8.45)**

NOTE: ( ) Standard deviation
Range 20 (low anxiety) - 80 (high anxiety)

Table 6: Mean scores for the subscales of the PCQ (revised) by framing category (pre-biopsy).

FRAMING CATEGORY	EMOTIONAL	PHYSICAL	SOCIAL
I have cancer	11.67 (1.15)	8.00 (3.61)	5.00 (1.00)
Suspended judgement	8.00 (4.72)	3.78 (2.84)	2.33 (1.75)
I do not have cancer	4.50 (3.96)	3.00 (3.07)	1.88 (2.36)
TOTAL SAMPLE	**7.41 (4.70)**	**4.00 (3.20)**	**2.48 (2.03)**

NOTES:

( ) Standard Deviation

Ranges (emotional 0-15, physical 0-12, social 0-9)

Low score = Little disfunction in the given domain

High score= A great deal of disfunction in the given domain

Table 7: Proportion of women in agreement with each of the PCQ (revised) items by framing category (pre-biopsy).

ITEM	I HAVE CANCER OR SUSPENDED JUDGEMENT	I DO NOT HAVE CANCER	TOTAL SAMPLE
Had trouble sleeping	66.7 (14)	50.0 (4)	62.1 (18)
Experienced a change in appetite	42.9 (9)	25.0 (2)	37.9 (11)
Been unhappy or depressed	61.9* (13)	12.5* (1)	66.7 (14)
Been scared & panicky	61.9* (13)	12.5* (1)	66.7 (14)
Felt nervous or strung up	66.7 (14)	37.5 (3)	58.6 (17)
Felt under strain	71.4 (15)	37.5 (3)	62.1 (18)
Found you have been keeping things from those who are close to you	61.9 (13)	12.5* (1)	66.7 (14)
Found yourself taking things out on other people	19.0 (4)	12.5 (1)	17.2 (5)
Found yourself noticeably withdrawing from those who are close to you	14.3 (3)	12.5 (1)	13.8 (4)
Had difficulty doing things around the house that you normally do	23.8 (5)	25.0 (2)	24.1 (7)
Had difficulty meeting work or other commitments	19.0 (4)	12.5 (1)	17.2 (5)
Felt worried about your future	76.2 (16)	37.5* (3)	65.5 (19)
N	**72.4 (21)**	**27.6 (8)**	**100 (29)**

Table 8: Feelings since notification of biopsy results by framing category.

FRAMING	Fine/great	Physical complaints	Still worries	N
I have cancer	00.0 (0)	33.3 (1)	66.7 (2)	10.3 (3)
Suspended judgement	77.8 (18)	11.1 (2)	11.1 (2)	27.6 (8)
I do not have cancer	75.0 (6)	12.5 (1)	12.5 (1)	62.1 (18)
N	69.0 (20)	13.8 (4)	17.2 (5)	100.0 (29)

Table 9: Summary of subjects' reactions to their biopsy result by framing category.

	POSITIVE REACTION	NEGATIVE REACTION
I have cancer	33.3 (1)	66.7 (2)
Suspended judgement	73.9 (17)	5.6 (1)
I do not have cancer	87.5 (7)	12.5 (1)
TOTAL	86.3 (25)	13.7 (4)

NOTE: ( ) N

Table 10: Stress rating of the mammogram abnormality and biopsy by framing category (proportions).

FRAMING	MOST STRESS	ON PAR	MADE A COMPARISON	LEAST STRESS	TOTAL
I have cancer	100.0 (3)	00.0 (0)	00.0 (0)	00.0 (0)	10.3 (3)
Suspended judgement	33.3 (6)	16.7 (3)	22.2 (4)	27.8 (5)	62.1 (18)
I do not have cancer	16.7 (3)	25.0 (2)	00.0 (0)	37.5 (3)	27.6 (8)
TOTAL	41.4 (12)	17.2 (5)	13.8 (4)	27.6 (8)	100.0 (29)

NOTE: ( ) N

Table 11: Proportion of subjects content and not content with their mammography and biopsy findings by framing category.

FRAMING	CONTENT	NOT CONTENT OR MIXED FEELINGS	TOTAL
I have cancer	33.3 (1)	66.7 (2)	10.3 (3)
Suspended judgement	65.2 (15)	16.7 (3)	62.1 (18)
I do not have cancer	87.5 (7)	12.5 (1)	27.6 (8)
TOTAL	79.3 (23)	20.7 (6)	100.0 (29)

NOTE: ( ) N

Table 12: Comparison of pre and post biopsy means for the state and trait anxiety subscales by framing category.

FRAMING	STATE ANXIETY		TRAIT ANXIETY	
	PRE BIOPSY	POST BIOPSY	PRE BIOPSY	POST BIOPSY
I have breast cancer	58.33 (5.77)	43.33 (15.18)	33.00 (5.20)	30.00 (4.58)
Suspended judgement	52.11 (10.18)	32.00 (13.06)	36.00 (9.06)	34.33 (9.63)
I do not have breast cancer	40.88 (10.12)	28.88 (10.05)	32.88 (8.32)	33.75 (8.58)
OVERALL SAMPLE	**49.66 (11.17)**	**32.31 (12.71)**	**34.83 (8.45)**	**33.73 (8.83)**

NOTE: ( ) standard deviation

Table 13: Proportion of subjects with high state anxiety scores in each of the framing categories (post biopsy).

	HIGH ANXIETY	N
I have cancer	66.7 (2)	3
Suspended judgement	16.7 (3)	18
I do not have cancer	12.5 (1)	8
TOTAL	20.7 (6)	29

NOTE: ( ) N

TABLE 14: Proportion of subjects who felt that the PCQ (revised) items were not applicable by framing category (post biopsy).

ITEM	I HAVE CANCER OR SUSPENDED JUDGEMENT	I DO NOT HAVE CANCER	OVERALL SAMPLE
A sense of reassurance that you do not have breast cancer	00.00 (0)	00.0 (0)	00.0 (0)
Feeling more relaxed since you received your biopsy report	4.8 (1)	0.0 (0)	3.4 (1)
Improved relationship with friends or relations	57.1 (12)	50.0 (4)	55.2 (16)
Feeling more able to do the things that you normally do	42.9 (9)	62.5 (5)	48.3 (14)
Feeling more able to meet your home and/or work responsibilities	42.9 (9)	62.5 (5)	48.3 (14)
Feeling more hopeful about the future	4.8 (1)	12.5 (1)	6.9 (2)
Feeling less anxious about breast cancer	00.0 (0)	12.5 (1)	3.4 (1)
Getting on better with those around you	52.4 (11)	62.5 (5)	55.2 (16)
Been sleeping better	33.3 (7)	37.5 (3)	34.5 (10)
A greater sense of well being	9.5 (21)	25.0 (2)	13.8 (4)
N	**72.4 (21)**	**27.8 (8)**	**100.0 (29)**

NOTE: ( ) N

TABLE 15: Proportion of subjects in agreement with each of the PCQ (revised) items by framing category (post biopsy).

ITEM	I HAVE CANCER OR SUSPENDED JUDGEMENT	I DO NOT HAVE CANCER	OVERALL SAMPLE
A sense of reassurance that you do not have breast cancer	81.0 (17)	87.5 (7)	82.8 (24)
Feeling more relaxed since you received your biopsy report	81.0 (17)	87.5 (7)	82.8 (24)
Improved relationship with friends or relations	33.3 (7)	25.0 (2)	31.0 (9)
Feeling more able to do the things that you normally do	47.6 (10)	37.5 (3)	44.8 (13)
Feeling more able to meet your home and/or work responsibilities	47.6 (10)	37.5 (3)	44.8 (13)
Feeling more hopeful about the future	71.4 (15)	87.5 (7)	72.4 (21)
Feeling less anxious about breast cancer	61.9 (13)	87.5 (7)	69.0 (20)
Getting on better with those around you	38.1 (8)	25.0 (2)	34.5 (10)
Been sleeping better	47.6 (10)	50.0 (4)	48.3 (14)
A greater sense of well being	61.9 (13)	75.0 (6)	65.5 (19)
N	**72.4 (21)**	**27.8 (8)**	**100.0 (29)**

NOTE: **( ) N**

CONSENT TO PARTICIPATE IN BIO-MEDICAL RESEARCH

TITLE: The Psychological Consequences of Receiving a False Positive Mammogram.

INVESTIGATORS: Ms. Jean Cook & Dr. Michael Murray

You have been asked to participate in a research study. Participation in this study in entirely voluntary. You may decide not to participate or may withdraw from this study at any time without affecting your normal treatment.

Confidentiality of information concerning participants will be maintained by the investigator. The investigator will be available during the study at all times should you have any problems or questions about the study.

The purpose of this study is to examine women's perceptions of mammography testing and breast biopsies. Specifically, the main aim of this study is to learn more about the experiences of women who receive benign (i.e. no cancer is detected) breast biopsies.

Participation in this study involves taking part in either one or two interviews. In order to learn more about the experiences of women awaiting a breast biopsy, I would like to conduct an interview one week prior to your scheduled biopsy. This interview will take no longer than one half hour of your time.

My research focus is on the experiences of women who receive a benign (no cancer is detected) biopsy report. Consequently, only women who are informed that they do not have cancer will be asked to take part in a second interview. The surgeon will forward the results of the biopsies to the principal investigator. This information will be held in strictest confidence. The names of participants will not appear in any report or article published as a result of this study.

The purpose of this second interview is to learn more about the experiences of women who receive a benign (no cancer is detected) biopsy report. This second interview will take place approximately 6-8 weeks after notification of the biopsy report. It is estimated that this interview will take no longer than 1 hour.

Thank-you for taking the time to consider participating in this study. If you decide to participate in this study and have no further questions, please sign below.

Sincerely,

Jean Cook, Masters Candidate
Principal Investigator

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities.

I_____, agree to participate in the research study described above.

Any questions Have been answered and I understand what is involved in the study. I realise that participation is voluntary and that there is no guarantee that I will benefit from my involvement. I acknowledge that a copy of this form has been offered to me.

_____ _____
(Signature of Participant) (Date)

_____
(Witness)

Instructions: Over the last week how often have you experienced the following because of thoughts and feelings about breast cancer.

Had trouble sleeping.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Experienced a change in appetite.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Been unhappy or depressed.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Been scared and panicky.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Felt nervous or strung up.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Felt under strain.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Found you have been keeping things from those who are close to you.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Found yourself taking things out on other people.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Found yourself noticeably withdrawing from those who are close to you.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Had difficulty doing things around the house that you normally do.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Had difficulty meeting work and other commitments.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

Felt worried about your future.

0	1	2	3
Not at all	Rarely	Some of the time	Quite a lot of the time

INTERVIEW 1 QUESTIONS:

Why did you have a mammogram?

Do you have a history of breast cancer in your family?

What were you thinking about when you went for your mammogram?

What were your first thoughts when you heard that there was something there?

Now that you have had time to think about it, how do you feel about it now?

What do you see as the purpose in the biopsy?

INTERVIEW 2 QUESTIONS:

How have you been feeling since you received your biopsy report?

What was your biopsy result?

What was your reaction to your biopsy report?

What events did you find most distressing fror the time that the lump was found until you received your biopsy result?

Has there been any events that have occurred in your life since you have received the biopsy that you would consider stressful?

From the time that the lump was found until you received your biopsy report, did you speak with/did you want to speak with anyone about how you were feeling?

Were there any specific people who were particularly helpful or comforting to you during this time?

During this time did you read or did you want to read anything on either breast cancer or mammography?

With respect to other events/crisis that have occurred in your life, how would you rate this one in terms of stress?

What is your opinion on mammography? On a scale of 1 to 100, with 1 being not at all and 100 being extremely, how would you rate your confidence in mammography testing?

What is your opinion on biopsies? Using the same sort of scale, with 1 being not at all and 100 being extremely, how would you rate your confidence in the findings of biopsy procedures?

Is there a history of breast cancer in your family?
Does anyone in your family have cancer?

Do you have any of friends or close co-workers have/had cancer?

Was this your first mammogram?
Will you have another mammogram in the future?

Have you had any further concerns about your mammography or biopsy report?

INSTRUCTIONS: All things considered, would you say that your mammography/biopsy experience has caused any of the following:

A sense of reassurance that you do not have breast cancer.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Feeling more relaxed since you received your biopsy report.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Improved relationships with friends or relations.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Feeling more able to do the things that you normally do.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Feeling more able to meet your home and/or work responsibilities.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Feeling more hopeful about the future.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Feeling less anxious about breast cancer.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Getting on better with those around you.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

Been sleeping better.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal

A greater sense of well being.

0	1	2	3
Not at all	a little bit	Quite a lot	A great deal