Examining the effects of individual versus group education on BSE learning and practice in young women.

Carie. Stewart

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Examining the Effects of Individual versus Group Education on BSE Learning and Practice in Young Women

by

Carie Stewart

A Masters Thesis
Submitted to the Faculty of Graduate Studies and Research through Applied Social Psychology in Partial Fulfillment of the Requirements for the Degree of Master of Arts at the University of Windsor

Windsor, Ontario, Canada

2001
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Abstract

The two purposes of the present study were: (1) to determine whether individual educational interventions are more effective than group interventions in terms of increasing BSE knowledge and behaviour; and (2) to test the existing components of the theory of planned behaviour (TPB), determining whether self-identity is a valuable addition to the model when predicting BSE practice. The sample consisted of 104 women recruited from the participant pool of undergraduate students in the Psychology Department of the University of Windsor. This study utilized a pre-test, intervention, post-test design with a three-month follow-up, and the inclusion of a control group. The intervention, designed with the aid of the Ontario Breast Screening Program in Windsor, was administered in both individual and group contexts to determine which was more effective in terms of BSE learning and practice. As predicted, individual interventions were found to be the most effective in increasing BSE practice from pre-test to follow-up. Further research is needed directly comparing the effectiveness of individual and group BSE educational interventions. Results indicated that self-identity was the only TPB-related variable that emerged as a significant predictor of the unique variance in BSE frequency at pre-test, whereas attitudes emerged as the only significant unique predictor of BSE frequency at follow-up. Findings lend strong support for the formal addition of self-identity to the TPB model.
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Chapter I

Introduction

Breast cancer is a leading cause of cancer death in women. The best way to lower the mortality rate for this disease is early diagnosis, which is not possible without the initial detection of an abnormality in the breast. In addition to having bi-annual mammograms and annual clinical breast exams, women can take responsibility for their own breast health by conducting monthly breast self-examinations. However, women need to learn about BSE technique and timing before it can be incorporated into their daily lives. Research aimed at determining the best way to introduce women to BSE has been underrepresented in the literature. The goal of the present study was to determine whether the mode of delivering BSE information influences intentions and practice of BSE. Such information can be conveyed from one person to another (e.g. when a doctor or nurse is dealing with a patient), or from one person to a group (e.g. in a classroom discussion or demonstration).

There are many factors that can influence whether or not a woman practices BSE on a regular basis. Obviously, one such factor is whether she has been exposed to information about the technique (Jones, 1978). Additional factors might include the attitudes of significant others towards performing BSE, beliefs about the usefulness of BSE, perceived barriers to performing BSE (i.e. fear of finding a lump, or forgetting), and confidence that one can perform BSE accurately (van Ryn, Lytle & Kirsch, 1996). The Theory of Planned Behaviour...
(TPB) was developed by Ajzen (1988) to help describe more complex behaviours that are not under our complete control. Considering the many factors that influence the regular practice of BSE, TPB will be applied to aid in our understanding of this complex health behaviour.

**Breast Cancer and the Need for Screening**

The incidence of breast cancer continues to rise in North America. Breast cancer is the second leading cause of cancer death in women, just behind lung cancer. It has been estimated that 1 out of every 9 women in Ontario, who reach age 70, will develop breast cancer (Canadian Cancer Society, 1998). The best way to lower mortality rates from breast cancer is early diagnosis; 91% of patients with breast cancer discovered at Stage I will be alive in 5 years, as opposed to 18% of those whose tumors have advanced to Stage IV at the time of diagnosis (American Cancer Society, 1997). Breast screening techniques recommended by the Canadian Cancer Society (1998) include having a bi-annual mammogram (starting at age 50), an annual clinical breast exam by a health professional, and performing monthly breast self-examinations. Breast self-examinations are free and do not take up very much time (around 5 minutes per month). Despite the obvious importance of early detection of breast lumps, only 40% of young women consider their self-examination practices to be regular. Of these 40%, only about 27% actually perform BSE monthly (Budden, 1995; Budden, 1999; Stamler, Thomas, & Lafreniere, 2000). This is a liberal estimate considering the tendency to over-report desirable behaviours.
Why aren't most women performing BSE? Reported barriers to doing BSE include: lack of confidence in one's exam, fear of finding an abnormality, forgetting, and lack of privacy (Budden, 1995; Vietri, Poskitt, & Slaninka, 1997). The discrimination of normal from abnormal tissue during BSE may be difficult because normal breast tissue can be granular or lumpy. If women are uncertain about their findings, then they may not practice BSE. Interestingly, the most commonly identified resource for obtaining BSE information is a doctor (42%), even though only roughly 17% of women indicate that they have actually received BSE instruction from a doctor (Budden, 1995; Stamler et al., 2000). There appears to be a significant discrepancy between what society believes doctors are teaching women about BSE, and what is actually being taught.

**Need for BSE Instruction for School-aged Women**

Although the American Cancer Society recommends that the practice of monthly BSE begin at age 20 years, BSE is occasionally taught to younger adolescents in private offices, clinics, and high school health classes. The American Academy of Paediatrics recommends that BSE teaching begin at age 14 (Cromer, Frankel, Hayes, & Brown, 1992), even though breast cancer rarely occurs in young women - accounting for less than 8% of all breast cancers (Budden, 1999; Diehl, & Kaplan, 1985). Young women (12 to 20 years) who perform BSE familiarize themselves with their breasts, which assists them in identifying breast deviations from the normal and establishing health practices
that can help them when they move into the age risk group for breast cancer (>45 years; Budden, 1995).

Research examining BSE knowledge and practices of young women exclusively is in short supply. The standard age range used by prominent researchers in the area of young women's breast health practices is 17-40 years of age (e.g. Budden, 1999). Teaching young women to perform BSE while still in school may increase the likelihood that they will incorporate this practice into their behavioural repertoire. More importantly, regardless of whether the behaviour becomes habit while women are still adolescent (or in their early 20s), the behaviour will have at least been learned. A behaviour that is learned is obviously more likely to be recalled and performed at a later time than a behaviour that is never properly learned. The majority of young women learn BSE primarily through pamphlets and oral instructions, given to them by either their doctors or teachers (Strickland, et al., 1997; Budden, 1995). Once women have reached adulthood and performing monthly BSE is critical, it is even more likely that doctors will merely encourage BSE without actually teaching the technique.

Diverse Sampling and Breast Health Research

A significant amount of research in the area of breast health has been conducted by academics in the nursing field, and has involved convenience sampling of nurses or nursing students (e.g. Budden, 1995; 1999; Cope, 1992; Kurtz, Given, Given, & Kurtz, 1993; Lauver, 1989). Women in the field of nursing
come from a wide range of backgrounds, but because of their unanimous interest in the field of health, it is difficult to generalize the findings of this research to more diverse populations.

It is also difficult to generalize findings when samples are ethnically homogenous. Ethnic homogeneity is common when samples are drawn from university settings. It is important to look at research involving non-white samples in order to gain an understanding of the limitations of using homogenous samples. Research conducted by Foxall, Barron, and Houfek (1998) compared breast self-examination practices and beliefs of African American and Caucasian women and found that more of the African American women examined their breasts 12 or more times during the year. African American women were also more likely to consider BSE beneficial, and to feel confident in doing BSE. In contrast, Caucasian women perceived more barriers to doing BSE.

Other research conducted using a sample of entirely African American women found that fear was the primary reason not to engage in breast cancer screening. More importantly, this study, using a focus group methodology, found that breast cancer is seldom discussed within the African American community. This secrecy has lead to breast cancer being viewed as a “white woman’s disease,” and the fact that African American women are more likely to be diagnosed with breast cancer at a more advanced stage (Phillips, Cohen, & Moses, 1999). African American women appear to hold misconceptions regarding the etiology and fatalism of breast cancer outcomes. Awareness of
issues relating to ethnically diverse populations is important for designing research interventions, and interpreting outcomes.

**Methods of Teaching BSE**

Individual instruction using an artificial breast model and professional feedback has been identified as more effective in promoting frequency and lump detection than a pamphlet or video-demonstration (Strickland, et al., 1997; Assaf, Cummings, Graham, Mettlin & Marshall, 1985). Champion and Scott (1993) have found proficiency to be dependent upon receiving an intervention involving a standardized teaching procedure using a silicone breast model. This research also supports providing procedural information as well as information about health beliefs relating to BSE in an intervention.

One study revealed a low rate of performing BSE amongst teenaged women who had never received BSE instruction (Cromer, Frankel, Hayes & Brown, 1992). These young women were then shown how to perform BSE via group instruction using a silicone breast model. Although proficiency was relatively high at a three-month follow-up, the rate of performance (at the correct time during the menstrual cycle) was low (12%) at a three-month follow-up and ceased almost completely at an eight-month follow-up (only 4% reported performing BSE at least once since the three month follow-up).

These results are low when compared to performance rates found in a study of women ranging in age from 20 to 87 years conducted by Lauver (1989). Lauver found that frequency of performing BSE was high for women who
received one of her four types of instructional interventions. The interventions were all between 6 and 11 minutes long and tape-recorded to control for content and tone of presentation. The first intervention gave women basic information on the steps of BSE, adapted from pamphlets from the American Cancer Society. The second intervention included tactile sensory information in addition to the basic information. Tactile information included clarifying descriptions about the characteristics of normal and abnormal breast tissue. Participants in this group also got to feel for abnormalities in an artificial breast model. A third intervention included coping technique instructions, designed to deal with the possibility of abnormality and uncertainty of findings, in addition to the basic steps information. A fourth group received tactile sensory information, coping technique instructions, and the basic steps information. According to Lauver's findings, 82% of women who received any of the interventions indicated at a three-month follow-up that they had performed BSE at least twice in the previous three months. This frequency of performing regular BSE was maintained at a six-month follow-up. An explanation that Lauver offers for the consistency of BSE behaviour across all conditions is the fact that women in all conditions volunteered to take part in the study, and were therefore at least moderately motivated to learn about and practice BSE.

These two studies (Lauver, 1989 and Cromer et al., 1992) incorporated similar educational interventions and yielded very different results. Both studies incorporated the use of an artificial breast model in conjunction with factual
information. The primary difference between the two studies was the degree of personal attention given during the interventions. Cromer et al. (1992) administered their intervention to groups of 35 to 41 women with one clinical nurse specialist, whereas Lauver administered interventions on an individual basis. This indirectly supports the use of individual interventions to teach BSE.

No research has been conducted directly comparing individualized and group interventions. Cromer et al. (1992) suggest that such research should be conducted, especially with young women receiving educational interventions for BSE. After conducting group interventions, these authors hypothesized that an individual intervention would be more effective in increasing the frequency of BSE in young women.

The Theory of Reasoned Action (TRA)

According to Ajzen and Fishbein's theory of reasoned action (1980), behavioural intention will in most cases be the best predictor of subsequent behaviour. Intentions represent the individual's personal aims with regard to the behaviour, i.e. whether they believe they will perform the behaviour. Behavioural intention is seen as being determined by two factors: Attitude toward the behaviour, and subjective norms. An individual's attitude toward a specific behaviour is seen as arising from a set of beliefs about the consequences of carrying out the behaviour (behavioural beliefs), weighed by an evaluation of each of these consequences (outcome evaluations). In this case, the attitude under study is the attitude toward performing BSE. Similarly, subjective norms are the
perceptions of social pressure from significant others to perform the behaviour (normative beliefs), weighed by one’s motivation to comply with the perceived wishes of these other people (motivation to comply). To illustrate the theory more clearly, if a woman realizes the importance of performing BSE (behavioural belief) and is influenced by a close friend who encourages the regular practice of BSE (normative belief), she is more likely to have the intention to perform BSE herself. According to the TRA, intention to perform BSE directly predicts the behaviour.

This theory has provided one of the most influential contributions to the field of attitude measurement and the subsequent prediction of behaviour. Although not specifically developed to study health issues, the TRA has been applied with this focus. For instance, one study examining the ability of the TRA to predict intentions to diet and exercise found that the TRA was able to predict intention to a high degree (Sejwacz, Ajzen, & Fishbein, 1980).

In its original form, the theory of reasoned action assumed that most behaviour is under volitional control and is therefore determined primarily by the individual’s intention to perform a given action. This means that a person’s intention to perform a given action is regarded as the immediate precursor to behaviour. In recent years it has become increasingly apparent that many factors can disrupt the intention-behaviour relationship. For some behaviours there may be personal deficiencies (i.e. in skills, abilities, knowledge, planning). For other behaviours there may be external obstacles such as time or opportunity that may
limit behavioural outcomes. In order to accommodate such factors, the conceptual framework of the TRA was extended by Ajzen (1988) in the theory of planned behaviour (TPB).

**The Theory of Planned Behaviour (TPB)**

The theory of planned behaviour (Ajzen, 1988) recognizes the possibility that certain behaviours may not be under complete volitional control. Volitionality refers to the degree to which an individual is, or perceives him/herself to be, capable of performing a particular act. Another way of labelling this concept is as perceived behavioural control. Perceptions of control are important to consider if the theory is to be extended beyond easily performed, volitional behaviours to those complex outcomes, which require the performance of complex series' of behaviours (Connor & Armitage, 1998). As in the TRA, intention is considered to be the immediate precursor to behaviour. Intentions incorporate the motivational factors that influence behaviour. That is, intentions are indications of how hard a person is willing to try to perform a behaviour. The stronger the intention to engage in a behaviour, the more likely it is that the behaviour will be performed. It is important to keep in mind that behavioural intentions are directly expressed in behaviours when the behaviour in question is under complete volitional control (Ajzen, 1991). When behaviours are not under complete control, other factors need to be considered when predicting behaviour.
To take into account the fact that many behaviours are not under our complete control, the TPB includes three rather than two independent determinants of intention (Figure 1). As in the theory of reasoned action, attitude and subjective norms influence intentions. In addition, perceived behavioural control (PBC) has been found to predict intentions to act, over and above attitudes and subjective norms. Perceived behavioural control is the individual’s perception of the extent to which performance of the behaviour is easy or difficult (Ajzen, 1991). Ajzen’s (1988) conception of perceived behavioural control is analogous to Bandura’s (1982) concept of self-efficacy, which states that a person has a perception of which behaviours are required to reach a goal, and a belief regarding whether or not they will be able to successfully perform those behaviours. Individuals who believe they lack the necessary resources or opportunities to perform a particular behaviour like BSE are unlikely to form strong behavioural intentions, despite the fact that their attitudes and perceptions of subjective norms may be in favour of performing the behaviour (Giles & Cairns, 1995).

A number of studies have examined and lent support to the TPB. Godin and Kok (1996) conducted a comparative review of 56 studies applying Ajzen’s TPB in the domain of health. These 56 studies were classified in the following behavioural categories: Addictive (i.e. cigarettes, alcohol, drugs, eating disorders), automobile, clinical and screening (i.e. cancer screening, health
Figure 1

**Theory of Planned Behaviour**

Note: The broken arrow represents a path that is only present for behaviours in which actual control is incomplete.
check), eating, exercising, HIV/AIDS, and oral hygiene. It was found that all of these studies provided information to verify, totally or partially, the effectiveness of the TPB to explain intention or predict behaviour.

Just as the TRA was expanded by adding the concept of perceived behavioural control, the theory of planned behaviour is open to revisions and the possibility of including additional predictors (Ajzen, 1991). Ajzen notes that additional predictors should only be added if it is demonstrated that they capture a significant portion of the variance in intention or behaviour after the theory's current variables have been accounted for.

In the original the TPB, Ajzen (1988) operationalized perceived control as the estimated frequency of encountering certain barriers to the behaviour in question. This component of the theory, however, has attracted criticism. Using a multiple regression analysis, Giles and Cairns (1995) failed to produce evidence that perceived behavioural control serves as a measure of actual control. Ajzen (1988) argued that for PBC to serve as a measure of actual control, certain conditions must be met: The behaviour must at least in part be determined by factors beyond a person's control and perceived control must be reasonably realistic, reflecting actual control to a reasonable degree. In the study by Giles and Cairns (1995), lack of opportunity disrupted the intention-behaviour relationship. Their study examined blood donation behaviour and several uncontrollable factors interfered with intentions to donate (i.e. catching a cold or losing weight). Research conducted by Beale and Manstead (1991) found weak
internal reliability of items designed to measure the perceived behavioural control construct.

It seems that Ajzen's (1988) concept of perceived behavioural control was oversimplified. In his writing, Ajzen (1991) contradicts himself with regard to this variable. He argues that PBC is synonymous with Bandura's (1982) concept of self-efficacy which states that a person has a perception of which behaviours are required to reach a goal, and a belief regarding whether or not he/she will be able to successfully perform those behaviours. However, his own description of the relationship between PBC and behaviour focuses on PBC as both a reflection of skills and ability and as a measure of actual control. It seems then, that perceived behavioural control as a reflection of actual control is a necessary variable in the theory of planned behaviour, but is not sufficient, as the concept of self-efficacy has been incorporated into Ajzen's (1991) operational definition of PBC.

As suggested by Connor and Armitage (1998), the implication is that PBC needs to be formally separated into two control processes: Self-efficacy (personal control over internal resources such as self-confidence, skills, or ability) and perceived locus of control (perceived controllability of environmental constraints on behaviour; Connor & Armitage, 1998). Studies provide clear evidence for a distinction between self-efficacy and PBC (e.g. Dzewaltowski, Noble & Shaw, 1990; Manstead & van Eekelton, 1998). The fact that the evidence for the distinction between self-efficacy and PBC covers diverse behaviours such as food
choice, exercise and academic achievement suggests that the self-efficacy-PBC distinction is robust. Research that has incorporated self-efficacy into the TRA has found that self-efficacy significantly contributes to the prediction of behavioural intention, independent of attitudes and subjective norms (e.g. van Ryn, Lytle & Kirsch, 1996).

More recently, the theory of planned behaviour has attracted research interest in the area of perceived subjective norms. Reviews of the TPB have highlighted the need for further consideration of normative influences on behaviour. Godin and Kok (1996) have shown subjective norm to be the weakest predictor of intention in the TPB. While this could merely reflect the lesser importance of normative factors as determinants of intentions in the behaviours studied, a number of other explanations are possible. These include measurement problems and failure to tap the appropriate components of normative influence (Connor & Armitage, 1998).

Self-identity has been proposed as an extension of the normative component of the TPB. Self-identity is a concept used in areas of sociology and social psychology and therefore there is a range of definitions. In terms of the present study, self-identity is the salient part of an actor’s self, which relates to a particular behaviour. It reflects the extent to which an actor sees him- or herself as fulfilling the criteria for a societal role (Connor & Armitage, 1998). Self-identity reflects the idea that intentions are linked to identifiable societal roles and these roles drive intentions. For example, if a woman identifies herself as the
type of person who would practice BSE on a regular basis, her intentions to perform BSE regularly would be stronger. Biddle, Bank, & Slavings (1987) suggest conceptualizing self-identity as self-referent identity labelling (i.e. the labels people use to describe themselves).

In studying the TRA, researchers have found that self-referent labelling predicted behaviour above attitudes and subjective norms (Armitage & Connor, 1999B). In addition, researchers (e.g. Theodorakis, Bagiatis & Goudas, 1995) have found that self-identity predicts intentions above the previously existing components of the TPB (i.e. attitudes, subjective norms, and perceived behavioural control). Theodorakis et al. (1995) examined self-identity in the context of teaching individuals with disabilities, and found that self-identity mediated the effects of subjective norms on behavioural intention.

Despite the need to examine the utility of self-identity as an adjunct to the subjective norm component of TPB, there are challenges to studying self-identity, which need to be recognized. Identity theory and the TPB both assume that behaviour is performed as a result of some rational decision-making process. Following repeated performance of a behaviour, self-identity becomes more salient, compared to relatively unstable attitudes or the perceived social pressure from others (Connor & Armitage, 1998). It is suggested that people may be motivated by their need to maintain their self-concept. It may be difficult to tease apart past behaviour and self-identity in order to determine their effects on present behaviour independently.
The Theory of Planned Behaviour as Applied to BSE

A limited amount of research has been conducted using the theory of planned behaviour to predict BSE intentions and behaviour. The research that has been conducted supports the use of this model. One study, conducted by van Ryn, Lytle, and Kirscht (1996), examined the utility of TPB in predicting two health behaviours: Breast self-examination (a relatively simple behaviour), and exercise (a more complex behaviour). They found that TPB variables significantly predicted BSE performance, whereas they did not significantly predict exercise. It is suggested by these authors that BSE is perhaps a less complicated behaviour with fewer potential barriers, and that TPB is a model that is most appropriate for behaviours with few barriers.

Another study, by McCaul, Sandgren, O'Neill, and Hinsz (1993), examined the value of the TPB in predicting several health-protective behaviours including breast self-examination. Regression analyses indicated that attitude was a better predictor of intentions to perform BSE than subjective norms, and perceived control was the best predictor of intentions overall. Interestingly, it was found that perceived control was a better predictor of BSE than self-efficacy, which was defined as perceived ability and measured separately. The authors suggest that this may be due to the fact that perceived control is a better predictor of intentions, or because the self-efficacy measure was less reliable in this study (i.e. it only consisted of one item instead of two, as was the case for perceived control).
Although their research was not aimed directly at application, Ronis and Kaiser (1989) used the TPB to better understand BSE behaviour. Results from this study support the use of the TPB, and indicate that attitude toward BSE and confidence in ability to perform BSE directly influence BSE decisions. They suggest that, since attitudes toward BSE are generally positive, inspiring confidence is more important in an intervention aimed at increasing BSE behaviour.

Other research supporting the TPB as a useful model for predicting BSE behaviour emphasizes the importance of carefully operationalizing the predictors (Young, Lierman, Powell-Cope, Kasprzyk, & Benoliel, 1991). Specifically, these authors note that the predictive power of the model is greatest when the predictors (attitude, subjective norm, and perceived control) and behaviour are at the same level of specificity. For example, prediction is enhanced when considering attitude toward performing BSE monthly, measures of intention to perform BSE monthly, and reports of monthly behaviour. If one were to measure attitude toward general health promotion activities including exercise and diet, in order to predict BSE intention and behaviour, inaccurate prediction would be expected.

Rationale

Two areas of health psychology research merge to form the basis for the present study: Research focused on teaching BSE; and theoretically-based
research aimed at applying the theory of planned behaviour to predict BSE intentions and behaviours.

The two purposes of the present study were: (a) to determine whether individual interventions are more effective than group interventions in terms of increasing BSE knowledge, behaviour and self-efficacy; and (b) to test the existing components of TPB in predicting BSE, and also to determine whether self-identity is a valuable addition to the predictability of the model.

**Hypotheses Based on the Theory of Planned Behaviour**

The first question addressed in this study was, “do the established TPB variables (subjective norms, attitudes, intentions, perceived behavioural control, and self-efficacy) contribute significantly to the prediction of BSE behaviour?” It was hypothesized that each of these variables would make a unique contribution to the prediction of BSE practices.

The second question addressed was, “does self-identity predict BSE behaviour over and above the previously existing components of TPB?” It was hypothesized that self-identity would account for a significant proportion of the variance in BSE behaviour once the other TPB variables had been accounted for.

**Hypotheses Regarding Educational Interventions**

This study also addressed the question, “will exposure to an educational intervention which includes information about BSE and a BSE demonstration result in increased practice of BSE?” It was hypothesized that women who were
exposed to the BSE intervention would be more likely to practice BSE in the future than women not exposed to a BSE intervention.

The final question that was addressed in this study was, "do interventions delivered on a one-to-one basis result in greater practice of BSE than group interventions?" It was hypothesized that individual interventions would be more likely to influence future BSE practice than interventions delivered in a group setting.
Chapter II

Method

Participants

Participants for this study were drawn randomly from the Psychology Department participant pool at the University of Windsor. Students enrolled in the introductory psychology course and some upper level psychology courses offered at the university are entered into the pool and randomly selected for participation in research. Participation is entirely voluntary and the incentive is one (or more) bonus points toward the psychology course from which they were recruited in the pool.

For the purposes of this study 104 women between the ages of 18 and 24 were selected from the pool, with a mean age of 20 years. These women were randomly assigned (using a random numbers table) to one of three possible conditions: group intervention (n=34), individual intervention (n=40), and control condition (n=30).

For the individual intervention, participants were contacted by telephone to set up an appointment. For both the group intervention and control condition, participants were contacted by telephone and asked to commit to arriving at one of two sessions. Participants in the control condition received a brochure after completing the main questionnaire, but were not part of an educational session. Care was taken to ensure that all participants are treated in accordance with the ethical principles of the American Psychological Association, the Canadian
Psychological Association, and the University of Windsor throughout the course of this study.

**Measures**

**Background Information Questionnaire (Appendix A):** Participants were asked questions about their age, ethnicity, academic discipline, and year of study. Additional questions were included to determine frequency of BSE (adapted from the BSE Frequency/Proficiency Questionnaire; Champion, 1990), primary source of knowledge about BSE, whether BSE had ever been physically demonstrated, as well as personal and family history of breast cancer.

**BSE and Breast Cancer Knowledge Questionnaire (Appendix B):** The tool used to investigate knowledge of BSE in the present study was adapted from two separate questionnaires. The first was originally developed by Jones (1978) and modified by Cope (1992). Jones (1978) developed a questionnaire with 14 items designed to test cancer knowledge and behaviours of female participants. Ten items were true/false questions: Four questions pertained to cancer of the breast, four pertained to uterine cancer, and two were general knowledge questions about cancer. The remaining four questions were about cancer detection behaviours and were to be answered yes or no: Three questions pertained to breast cancer, and one to uterine cancer. Cope modified this questionnaire to include 25 items measuring the knowledge of breast cancer, the correct technique of BSE, its practice or non-practice, and the frequency of practice. The reliability and validity of this tool has not been established.
The second part of this questionnaire was adapted from the breast self-examination scale of the Health Care Practices Survey developed by Kurtz, Kurtz, Given, and Given (1993). Permission was granted to use and modify this instrument. The Health Care Practices Survey was designed to measure knowledge and practice of breast screening practices of women 35 years of age and over. This instrument has been used successfully with women, ranging in age from 18 to 68 years, in diverse areas of research such as, the utility of using the internet as a data collection tool, and examining breast health practices among working women (Thomas et al, 2000; Stamler et al., 2000). The Health Care Practices Survey has four subscales: Demographic and personal history information; breast screening scales pertaining to mammography (23 items), breast self-examination (17 items), and clinical breast examination (20 items). Each of the breast screening scales includes items on the following four subscales: Discomfort, lack of knowledge, desire for control over health, and perceived efficacy. Reported alpha reliability levels are greater than 0.75 for each of these four sub-scales, on all three breast screening scales.

The BSE and Breast Cancer Questionnaire consists of 17 items designed to measure knowledge of breast cancer and the correct technique of BSE. Eight of these items are from Cope (1992), and 9 are incorporated from Kurtz, Kurtz, Given, and Given (1993). Specific examples include: “The best position for doing BSE is to lie on your back with a pillow under your head” (false); “Palpation of breast tissue means using the fingertips of the hand to feel the breast tissue for
possible lumps” (true); and, “Once a person develops cancer, it is usually too late to do anything about it” (strongly agree to strongly disagree).

**Theory of Planned Behaviour Questionnaire (Appendix C):** The theory of planned behaviour questionnaire was adapted from a questionnaire developed by Armitage and Connor, 1999(A). This questionnaire was specifically intended to measure healthy eating practices and contained 45 TPB items. The sub-scales and alpha reliability levels for Armitage and Connor’s (1999A) questionnaire include: Intention (3 items, alpha = .86), direct attitude (6 items, alpha = .75), indirect attitude (8 items, alpha = .63), global subjective norm (4 items, alpha = .76), normative pressure (6 items, alpha = .74), direct self-efficacy (4 items, alpha = .83)/PBC (3 items, alpha = .71), indirect control beliefs (7 items, alpha = .58), and self-identity (4 items, alpha = .66).

**Intention:** Intention to perform BSE was assessed using three items, each on a 7-point Likert scale. For example, “I intend to perform BSE in the future” (definitely do—definitely do not), and “I want to do BSE in the future” (definitely do—definitely do not).

**Attitude:** Direct measures of attitude were assessed using a semantic differential scale (1 item). Respondents were presented with the sentence. “My performing BSE next month is...”. Eight pairs of adjectives were rated, each on a 7-point Likert scale. Examples of adjectives used are: bad/good, and favourable/unfavourable. Indirect measures of attitude were derived from the product of the perceived likelihood of salient outcomes, and the evaluation of
those outcomes. There are five outcome beliefs, an example of which includes:

“Doing BSE will let me detect abnormal breast tissue if it is there.” Both
likelihood and outcome were measured using Likert scales anchored by
unlikely/likely and good/bad, respectively.

**Subjective Norm:** A global measure of subjective norm was measured with a
composite score, derived from four items. An example of these items includes,
“People who are important to me think I should (do BSE/not do BSE)”. All items
were measured using 7-point Likert scales.

A specific measure of normative pressure includes statements related to
the extent to which individuals perceive social pressure from 6 referents (health
experts, friends, parents, media reporters, partner and family). Statements are
rated on a 7-point Likert scale. An example includes, “Health experts think I
(should practice BSE/should not practice BSE). Responses to these statements
were multiplied by their corresponding statement of influence (also rated on a 7-
point scale). For example, “With regard to practicing BSE, how much do you
want to do what health experts think you should? (not at all/very much).

**Self-Efficacy:** Self-efficacy (considered a component of direct control) was
determined by a mean score of six items (measured on a 7-point scale). Examples
include: “To what extent do you see yourself as capable of doing BSE? (very
capable/very incapable)”, and “I do not have the skills I need to perform BSE
(frequently inhibits BSE/never inhibits BSE)”.
Perceived Behavioural Control: PBC (a second component of direct control) was determined by a mean score of seven items (measured on a 7-point scale). Examples of these items include: "Whether or not I do BSE is entirely up to me (strongly agree/strongly disagree)“, and "Doing BSE is inconvenient (less likely to inhibit BSE/ more likely to inhibit BSE)“.

Self-Identity: Four self-identity items were measured on a 7-point Likert scale anchored by strongly agree/strongly disagree. Examples include: “I think of myself as a health conscious person”, and “I think of myself as someone who is aware of their breast health”.

Post-Intervention and Follow-up Questionnaire (Appendix D): This questionnaire is an abbreviated version of the main questionnaire components.

There are 2 items pertaining to background information (for the follow-up questionnaire only); the BSE and Breast Cancer Knowledge Questionnaire (17 items) is the same as in the main questionnaire; and the Theory of Planned Behaviour Questionnaire (26 items) is the same as in the main questionnaire, but the subscale for subjective norms has only been included in the follow-up questionnaire.

Design and Procedure

The present study was both experimental and exploratory. The study incorporated a pre-test, intervention, post-test design with a follow-up component after three months. Participants were randomly assigned to the three experimental conditions: Individual intervention, group intervention, and
(brochure only) control condition. Randomization of participants into conditions was achieved using a random numbers table. This was done prior to contacting participants.

There were 30-40 participants in each condition which allowed for 2 groups (of 15 and 19 participants respectively) for the group intervention condition. BSE frequency and knowledge was measured pre- and post-test, and again during a follow-up session three months later, as were each of the variables relating to the theory of planned behaviour.

1) Procedures for Control Group (brochure only) – First Session

Participants in the control group were recruited over the telephone to participate in a two-part study on health practices of university-aged women. Participants arrived at a classroom in the Psychology Department at one of two possible times (determined during the recruitment telephone call). Once participants had assembled, they were asked to sign the consent form (Appendix E). It was emphasized that consent was for participation in both components of the study. The first session for the control group participants took a maximum of 30 minutes to complete.

Participants were then asked to complete the main questionnaire (Appendices A, B, and C). Oral instructions (Appendix F) included an emphasis on the importance of the personal identifier to help match their responses.

Once this questionnaire was complete, participants were thanked for their participation, and debriefed according to the guideline in Appendix G. In
conjunction with the oral debriefing, participants in the control condition received the BSE pamphlet, BSE reminder stickers, and contact sheet. Refer to the section on debriefing and benefits of participation below for more detail.

2) Control Group (brochure only) – Follow-up Session

Three months after the first component of the study, participants were contacted to participate in a follow-up component. During the follow-up session, participants who did not receive any BSE instruction in the first session met in the Health Psychology Research Office at a time that was mutually convenient (this was determined during the follow-up recruitment telephone call). Participants were not asked to sign a consent form during the follow-up session because consent was given for the entire study during the first session. Once participants arrived, oral instructions (Appendix F) were given to participants before they filled out the follow-up questionnaire (Appendix D), and a debriefing session according to Appendix G followed the completion of the questionnaire.

3) Procedures Common to Experimental Conditions – First Session

Participants in the experimental conditions were recruited for a study examining young women’s attitudes toward breast health. The timing for each session (40 individual sessions, and 2 group sessions) was determined at the time of each recruitment telephone call. Each experimental session (for both conditions) took a maximum of 90 minutes. Participants began their first session by reading the consent form, which they were asked to sign (Appendix I). It was emphasized that consent was for participation in both components of the study.
Participants received oral instructions for filling out the main questionnaire (Appendix F). The main questionnaire was comprised of a demographics section (Appendix A), a test of BSE and breast cancer knowledge (Appendix B), and questions designed to measure variables pertaining to the theory of planned behaviour (Appendix C).

Participants were asked to choose a personal identifier (i.e. their mother's maiden name) and write this identifier on each questionnaire associated with this study. It was explained that there would be no way to identify the individual data of participants by means other than their self-generated personal identifier. The personal identifier was used to link pre- and post-test data, and follow-up data. Participants were assured that their actual names would never be linked to their data. The consent form was the only record of participation and was used only to award bonus points and contact participants for the follow-up component of the study.

Once the main questionnaire was completed, participants listened to a presentation pertaining to breast cancer and breast self-examination (Appendix J). Participants were given several opportunities throughout the presentation to ask questions. Following the presentation, participants had an opportunity to watch the primary researcher demonstrate breast examination using a breast model, and then practice with the model themselves.

Finally, participants were asked to fill out a post-test questionnaire (Appendix D), which is an abbreviated version of the main questionnaire
designed to measure knowledge and perceptions of breast cancer and BSE. Once the session was complete participants were debriefed according to the guideline in Appendix G. In conjunction with the oral debriefing, participants in the individual instruction condition received the BSE pamphlet, BSE reminder stickers, and a contact sheet. Refer to the section on debriefing and benefits of participation below for more detail.

4) Procedures Common to Experimental Conditions – Follow-up Session

Six weeks after the first component of the study took place, participants who supplied an email address on the consent form received an email reminding them about the follow-up component to the study. Three months after the first component of the study, participants were contacted by telephone to take part in a follow-up component. For the follow-up sessions, meeting times were subject to the schedules of both the participants and the primary researcher - this was determined during the follow-up recruitment telephone call. Each follow-up session took a maximum of 20 minutes to complete.

Participants were not asked to sign a consent form for this component because, as it was made clear during the first session, consent given during the first session was for both components of the study. Participants received oral instructions (Appendix F) before filling out the follow-up questionnaire. A debriefing session, which was slightly more expansive than during the first session, followed the completion of the questionnaire (Appendix H).
5) Procedures that Differed for Experimental Conditions - Both Sessions

For both the first and follow-up sessions, participants in the individual instruction condition arrived at the Health Psychology Research Office in the Department of Psychology where they were greeted by the primary researcher. Participants in the group instruction condition arrived at a classroom in the psychology department and chose a seat with the other participants for the first session. For the follow-up session, participants in the group instruction condition came to the Health Psychology Research Office to fill out the questionnaire.

During the educational component of the first session, participants in the group condition collectively listened to information pertaining to breast cancer and breast self-examination, while viewing corresponding overheads. There were no overheads used in the individual education sessions, but the researcher used notes consistent with the content of the overheads used in the group education sessions.

Also during the first session, participants in the individual condition received feedback regarding their technique when practicing with the breast model. Participants in the group education condition did not receive feedback. Several similar breast models were circulated throughout the room during the breast examination demonstration by the primary researcher.

The Educational Intervention

Information for both interventions (i.e. individual and group) was derived from material provided by the Canadian Cancer Society and the Ontario Breast
Screening Program. Delivery of the entire intervention took approximately 30 minutes. The primary researcher was trained to deliver the BSE intervention by the staff of the Ontario Breast Screening Program (OBSP) in Windsor, Ontario.

I Belief/Factual Knowledge Component

The group and individual interventions both included an informational session on myths and misconceptions about breast cancer and BSE, statistics about prevalence and deaths from breast cancer, susceptibility factors, the importance of early detection, appropriate timing of BSE, and suggestions for remembering to do BSE. An emphasis was placed on personal control and responsibility for doing BSE, and detecting abnormalities. Information for this component of the intervention was derived from literature put out by the Canadian Cancer Society, and a workshop model provided by the Ontario Breast Screening Program. Appendix J includes a summary of the content that was included in the intervention.

II Procedural Component

A teaching program based on the Canadian Cancer Society recommendations for BSE procedures was delivered to participants in both experimental conditions. The primary researcher was trained by staff of the OBSP to deliver the intervention using a breast model. For the group intervention, several breast models were passed around the group for participants to practice while the procedure was demonstrated and explained by the primary researcher. For the individual intervention, the demonstration and
practice were conducted similarly, controlling for the time participants had to practice with the breast model (in order to maintain similar experiences across conditions). The primary differences across conditions were the amount of feedback given to respondents during the session, and the presence of other women in the group setting.

**Debriefing and Benefits of Participation**

For the first session, participants in the control condition were debriefed after they completed the questionnaires (Appendix H). Participants in the experimental conditions were debriefed after their educational intervention session was complete, and the post-test questions had been answered. The debriefing included a general overview of the goals of the research, but no indication of the specific research hypotheses was revealed. Contact information was given for the primary researcher, the Canadian Cancer Society in Windsor, the Ontario Breast Screening Program in Windsor, and Medical & Health Services on the University of Windsor campus.

Debriefing was very similar during the follow-up session, but included information about the specific research hypotheses (Appendix H).

Aside from the obvious benefit of learning about BSE and breast health in general, all participants received BSE reminder stickers for use on contraceptive pill packages, date books, or calendars. The BSE reminder stickers (included in Appendix G) were offered as a token of appreciation only, and their effectiveness in increasing BSE frequency was not examined for the purposes of this study.
Chapter III

Results

Participant Profile and Preliminary Analyses

The average age of the 104 undergraduate women who participated was 20.40 years with a range of 18 to 24. The sample for this study was representative of ethnic diversity on the University of Windsor campus: 82% of participants self-identified as Caucasian, 10% self-identified as African or Jamaican Canadian, and 9% self-identified as other ethnic identities (i.e. Lebanese, South Asian, or Asian).

The sample also included women from a wide range of academic disciplines: 40% from psychology, 11% from criminology, 6% from nursing, 5% from sociology, 5% from social work, 5% from English, and 28% from 11 other disciplines on campus. With regard to their level of academic achievement, 33% were in their first year of university, 30% were in second year, 28% were in third year, and 10% were in fourth year.

With regard to discussion of BSE, 72% of women expressed that they had discussed BSE with someone in the past. Of those who had discussed BSE, 41% had discussed it with a doctor; 41% discussed it with their mother; 37% discussed it with a friend; 17% discussed it with a boyfriend; 11% discussed it with a nurse; 11% discussed it with a teacher; 9% discussed it with a sister; 2% discussed it with their grandmother; and 2% discussed it with an aunt.
When asked about their primary source of BSE knowledge, 21 women failed to answer the question. Of the 83 women who did answer the question, 25% indicated their doctor as their primary source of BSE knowledge; 19% indicated pamphlets; 16% indicated media/television; 13% indicated their mother as their primary source of knowledge about BSE; 13% indicated school; 8% indicated magazines; and less than 3% indicated nurse, pharmacy or textbook as their primary source of BSE knowledge.

When asked if they had ever been taught to do BSE according to a specific procedure, 49% of women reported that they had been taught to practice BSE. Of those who had been taught BSE, 26% were taught by their doctor; 25% learned it using a self-instructional booklet; 10% were taught by a parent; 10% were taught by a teacher; 8% were taught by a nurse; 8% were taught by an ‘other’ health professional; 3% learned it on television; and 2% were taught by a friend.

With regard to practicing BSE, 50% of women reported having practiced BSE at some point in their past. Of those who have practiced BSE, 1% practiced BSE more than once per month; 4% practiced BSE once every month; 4% practiced BSE once every two months; 11% practiced BSE once every 3-5 months; 10% practiced BSE once every 6-8 months; 9% practiced BSE once every 9-11 months; and 11% practiced BSE once a year or less.

Thirty-nine percent of women reported having had a clinical breast examination by a health professional. Of those who have had a clinical breast exam, 68% have it done once per year; 7% have it done once every two years; and
24% have it done less than once every two years. Forty-six percent of women had their last CBE done by a male health professional; and 54% of women had their last CBE done by a female health professional. When asked if they had a preference as to the sex of the health professional that performs their clinical breast exams, 58% reported that they prefer a female health professional to perform their CBE; and 42% reported that they have no preference with regard to the sex of the health professional performing their CBE. None of the women reported a clear preference for a male health professional to perform their CBE.

Seventy-two percent of women reported no family history of breast cancer; 23% reported that they do have a family history; and 6% were unsure of whether or not they have a family history of breast cancer. When asked about their personal history of breast health problems, 97% reported that they do not have a personal history; and 3% reported that they do have a personal history of breast health problems.

Two experimental groups in the group intervention condition were conducted separately during the initial data collection phase. In order to determine whether data from these two groups could be combined for purposes of analysis, t-tests were conducted comparing groups means for each independent variable of interest (Table 1). No significant differences were revealed, thereby justifying combining the data from the two groups.
Table 1

**T-tests Comparing Means for Group 1 and Group 2 in the ‘Group’ Experimental Condition**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>X Group 1</th>
<th>X Group 2</th>
<th>t-value</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast Cancer Knowledge</td>
<td>14.60</td>
<td>15.26</td>
<td>-1.41</td>
<td>32</td>
<td>.168</td>
</tr>
<tr>
<td>BSE Knowledge</td>
<td>10.60</td>
<td>10.58</td>
<td>.04</td>
<td>32</td>
<td>.971</td>
</tr>
<tr>
<td>Frequency BSE</td>
<td>3.33</td>
<td>3.55</td>
<td>-.31</td>
<td>18</td>
<td>.757</td>
</tr>
<tr>
<td>BSE Attitudes</td>
<td>5.45</td>
<td>5.42</td>
<td>.14</td>
<td>32</td>
<td>.889</td>
</tr>
<tr>
<td>BSE Intentions</td>
<td>5.98</td>
<td>6.12</td>
<td>-.43</td>
<td>32</td>
<td>.673</td>
</tr>
<tr>
<td>BSE PBC (Personal Control)</td>
<td>6.40</td>
<td>6.42</td>
<td>-.08</td>
<td>32</td>
<td>.935</td>
</tr>
<tr>
<td>BSE PBC (Barriers)</td>
<td>2.84</td>
<td>2.26</td>
<td>1.54</td>
<td>32</td>
<td>.134</td>
</tr>
<tr>
<td>BSE Subjective Norms</td>
<td>31.44</td>
<td>36.53</td>
<td>-1.29</td>
<td>31</td>
<td>.207</td>
</tr>
<tr>
<td>BSE Self-Efficacy</td>
<td>5.40</td>
<td>4.97</td>
<td>1.17</td>
<td>32</td>
<td>.251</td>
</tr>
<tr>
<td>BSE Self-Identity</td>
<td>4.95</td>
<td>5.00</td>
<td>-.10</td>
<td>32</td>
<td>.920</td>
</tr>
</tbody>
</table>
Scale Integrity

Recoding

Prior to analysis, several items on the BSE and Breast Cancer Knowledge Questionnaire (Appendix B) were recoded. Items A3, A4, A7, A8, B2, and C1 were recoded so that higher scores indicated greater knowledge of breast cancer, and BSE procedure. Items on several subscales of the Theory of Planned Behaviour Questionnaire (Appendix C) were also recoded. Items 2(1b), 2(1c), 2(1e), 2(1f), 2(1g), 2(1h), 2(3), and 2(5) were recoded so that higher scores indicated a more positive attitude about BSE. Items 4(3), and 4(4) were recoded so that higher scores indicated higher self-efficacy with regard to BSE. Items 5(6), and 5(7) were recoded so that higher scores indicated greater perceived control with regard to practicing BSE (i.e. scores indicated fewer perceived barriers to practicing BSE).

Theory of Planned Behaviour Questionnaire: Pre-test

The sub-scales and Cronbach’s alpha reliability levels for TPB variables, based on Armitage and Connor’s (1999A) questionnaire were as follows:

Intention (3 items, alpha = .88), attitude (6 items, alpha = .75), subjective norm (10 items, alpha = .83), self-efficacy (4 items, alpha = .73), PBC (personal control; 4 items, alpha = .76), PBC (barriers; 3 items, alpha = .73), and self-identity (4 items, alpha = .78).
Theory of Planned Behaviour Questionnaire: Post-test

The sub-scales and alpha reliability levels for TPB variables at post-test were as follows: Intention (3 items, alpha = .81), attitude (6 items, alpha = .84), self-efficacy (4 items, alpha = .60), PBC (personal control; 4 items, alpha = .70), PBC (barriers; 3 items, alpha = .68), and self-identity (4 items, alpha = .85).

Theory of Planned Behaviour Questionnaire: Follow-Up

The sub-scales and alpha reliability levels for TPB variables at follow-up were as follows: Intention (3 items, alpha = .92), attitude (6 items, alpha = .81), subjective norm (10 items, alpha = .80), self-efficacy (4 items, alpha = .64), PBC (personal control; 4 items, alpha = .57), PBC (barriers; 3 items, alpha = .65), and self-identity (4 items, alpha = .88).

Group Differences

Analyses of Variance

Analyses of variance were conducted comparing the means of the three experimental conditions (i.e. individual, group, and control) in order to determine if there were significant main effects of experimental condition for any of the independent variables of interest at pre-test (Table 2), post-test (Table 3), and follow-up (Table 4). Note that the control group did not provide post-test data.

BSE frequency was one variable on which experimental conditions significantly differed at pre-test, $F (2, 101) = 3.39$, $p = .04$. A Student-Newman-Keuls test with significance level .05 was conducted to examine post hoc
### Table 2

**Analyses of Variance Comparing Means of Experimental Conditions on Each Variable of Interest at Pre-Test**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Potential Range of Scores</th>
<th>Individual M</th>
<th>Individual SD</th>
<th>Group M</th>
<th>Group SD</th>
<th>Control M</th>
<th>Control SD</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE Frequency</td>
<td>0-7</td>
<td>M 0.90</td>
<td>SD 1.60</td>
<td></td>
<td></td>
<td>2.03</td>
<td>2.05</td>
<td>1.87</td>
</tr>
<tr>
<td>BSE Knowledge</td>
<td>2-16</td>
<td>M 10.58</td>
<td>SD 1.55</td>
<td></td>
<td></td>
<td>10.59</td>
<td>1.64</td>
<td>10.87</td>
</tr>
<tr>
<td>Breast Cancer Knowledge</td>
<td>0-20</td>
<td>M 14.53</td>
<td>SD 1.63</td>
<td></td>
<td></td>
<td>14.97</td>
<td>1.38</td>
<td>15.00</td>
</tr>
<tr>
<td>BSE Attitude</td>
<td>1-7</td>
<td>M 5.52</td>
<td>SD 0.55</td>
<td></td>
<td></td>
<td>5.43</td>
<td>0.61</td>
<td>5.48</td>
</tr>
<tr>
<td>BSE Intention</td>
<td>1-7</td>
<td>M 5.93</td>
<td>SD 1.12</td>
<td></td>
<td></td>
<td>6.06</td>
<td>0.97</td>
<td>6.08</td>
</tr>
<tr>
<td>BSE PBC (Personal Control)</td>
<td>1-7</td>
<td>M 6.21</td>
<td>SD 0.83</td>
<td></td>
<td></td>
<td>6.41</td>
<td>0.73</td>
<td>6.37</td>
</tr>
<tr>
<td>BSE PBC (Barriers)</td>
<td>1-7</td>
<td>M 2.77</td>
<td>SD 1.29</td>
<td></td>
<td></td>
<td>2.52</td>
<td>1.12</td>
<td>2.53</td>
</tr>
<tr>
<td>BSE Self-Efficacy</td>
<td>1-7</td>
<td>M 4.36</td>
<td>SD 1.39</td>
<td></td>
<td></td>
<td>5.16</td>
<td>1.06</td>
<td>4.78</td>
</tr>
<tr>
<td>BSE Self-Identity</td>
<td>1-7</td>
<td>M 4.79</td>
<td>SD 0.94</td>
<td></td>
<td></td>
<td>4.98</td>
<td>1.41</td>
<td>4.93</td>
</tr>
<tr>
<td>BSE Subjective Norms</td>
<td>2-56</td>
<td>M 29.90</td>
<td>SD 9.44</td>
<td></td>
<td></td>
<td>34.37</td>
<td>11.33</td>
<td>32.36</td>
</tr>
</tbody>
</table>

* p<.05

Note: Higher mean scores are reflective of a stronger knowledge of, or tendency toward key variables.
Table 3

Analyses of Variance Comparing Means of Experimental Conditions on Each Variable of Interest at Post-Test

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>M</th>
<th>SD</th>
<th>Individual</th>
<th>Group</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE Knowledge</td>
<td>12.58</td>
<td>1.39</td>
<td>11.53</td>
<td>1.26</td>
<td>11.28*</td>
</tr>
<tr>
<td>Breast Cancer Knowledge</td>
<td>17.18</td>
<td>1.20</td>
<td>16.38</td>
<td>1.71</td>
<td>5.48*</td>
</tr>
<tr>
<td>BSE Attitude</td>
<td>6.06</td>
<td>.61</td>
<td>5.93</td>
<td>.63</td>
<td>.80</td>
</tr>
<tr>
<td>BSE Intention</td>
<td>6.63</td>
<td>.60</td>
<td>6.51</td>
<td>.60</td>
<td>.78</td>
</tr>
<tr>
<td>BSE PBC (Personal Control)</td>
<td>6.32</td>
<td>.84</td>
<td>6.40</td>
<td>.73</td>
<td>.22</td>
</tr>
<tr>
<td>BSE PBC (Barriers)</td>
<td>2.20</td>
<td>1.12</td>
<td>1.96</td>
<td>.87</td>
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<tr>
<td>BSE Self-Efficacy</td>
<td>5.69</td>
<td>.87</td>
<td>5.70</td>
<td>1.01</td>
<td>.00</td>
</tr>
<tr>
<td>BSE Self-Identity</td>
<td>5.69</td>
<td>.88</td>
<td>5.65</td>
<td>1.11</td>
<td>.02</td>
</tr>
</tbody>
</table>

* p<.05
Table 4

**Analyses of Variance Comparing Means of Experimental Conditions on Each Variable of Interest at Follow-Up**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Individual</th>
<th>Group</th>
<th>Control</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE Frequency</td>
<td>M</td>
<td>1.64</td>
<td>1.14</td>
<td>1.29</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.19</td>
<td>1.01</td>
<td>1.10</td>
</tr>
<tr>
<td>BSE Knowledge</td>
<td>M</td>
<td>11.86</td>
<td>11.19</td>
<td>11.65</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.71</td>
<td>1.25</td>
<td>1.06</td>
</tr>
<tr>
<td>Breast Cancer Knowledge</td>
<td>M</td>
<td>16.21</td>
<td>16.95</td>
<td>16.00</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.69</td>
<td>1.32</td>
<td>1.32</td>
</tr>
<tr>
<td>BSE Attitude</td>
<td>M</td>
<td>5.74</td>
<td>5.68</td>
<td>5.38</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>.64</td>
<td>.76</td>
<td>.55</td>
</tr>
<tr>
<td>BSE Intention</td>
<td>M</td>
<td>6.07</td>
<td>6.06</td>
<td>6.10</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.12</td>
<td>.97</td>
<td>1.05</td>
</tr>
<tr>
<td>BSE PBC (Personal Control)</td>
<td>M</td>
<td>6.11</td>
<td>6.54</td>
<td>6.15</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>.86</td>
<td>.64</td>
<td>.76</td>
</tr>
<tr>
<td>BSE PBC (Barriers)</td>
<td>M</td>
<td>5.50</td>
<td>5.32</td>
<td>5.41</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.14</td>
<td>1.43</td>
<td>1.01</td>
</tr>
<tr>
<td>BSE Self-Efficacy</td>
<td>M</td>
<td>5.44</td>
<td>5.52</td>
<td>5.22</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.39</td>
<td>1.06</td>
<td>1.20</td>
</tr>
<tr>
<td>BSE Self-Identity</td>
<td>M</td>
<td>5.52</td>
<td>4.90</td>
<td>5.22</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>.96</td>
<td>1.47</td>
<td>1.03</td>
</tr>
<tr>
<td>BSE Subjective Norms</td>
<td>M</td>
<td>31.45</td>
<td>32.43</td>
<td>33.83</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>8.65</td>
<td>9.75</td>
<td>11.04</td>
</tr>
</tbody>
</table>

* p<.05
comparisons. This test revealed that participants in the control condition reported a significantly higher frequency of practicing BSE than did those in both the individual and group conditions. Self-efficacy was also a variable on which experimental conditions significantly differed at pre-test, $F(2, 101) = 3.85, p = .024$. A Student-Newman-Keuls test with significance level .05 revealed that participants in the group condition had significantly higher self-efficacy ($M=5.16$) than both the control condition ($M=4.78$), and the individual condition ($M=4.36$) at pre-test.

Experimental conditions significantly differed on BSE knowledge at post-test, $F(1,72) = 11.28, p = .001$. Participants in the individual condition had significantly more BSE knowledge ($M=12.58$) than the group condition ($M=11.53$) after the intervention was completed. Experimental conditions also significantly differed on breast cancer knowledge at post-test, $F(1,72) = 5.48, p = .02$. Participants in the individual condition had significantly more breast cancer knowledge ($M=17.18$) than participants in the group condition ($M=16.38$) after the intervention was completed. It should be noted that, although statistically significant, group differences in breast cancer and BSE knowledge at post-test were modest.

Experimental conditions did not significantly differ on any of the variables of interest at follow-up.
Repeated Measures Multivariate Analyses of Variance

Multivariate analyses of variance were conducted to examine group differences on variables of interest across repeated administration of measures.

Significant session (i.e. pre-test, post-test, follow-up) by condition (i.e. individual, group, control) interaction effects were found for several variables of interest. Multivariate analysis of variance revealed a significant interaction of experimental condition (individual and group) and session (pre-test, post-test, and follow-up) for breast cancer knowledge, $F(2, 94) = 5.27$, $p = .007$ (refer to Figure 2). A paired samples $t$-test revealed that those in the individual condition experienced a significant increase in breast cancer knowledge from pre-test ($M = 14.53$) to post-test ($M = 17.18$), $t = -8.35$, $p = .00$. A second paired samples $t$-test revealed a significant decrease in breast cancer knowledge for those in the individual condition from post-test ($M = 17.21$) to follow-up ($M = 16.21$), $t = 2.67$, $p = .01$. A paired samples $t$-test revealed that those in the group condition experienced a significant increase in breast cancer knowledge from pre-test ($M = 14.97$) to post-test ($M = 16.38$), $t = -4.24$, $p = .00$. A second paired samples $t$-test revealed no significant difference in breast cancer knowledge for those in the group condition from post-test to follow-up.

Multivariate analysis of variance revealed a significant interaction of experimental condition (individual and group) by session (pre-test, post-test, and follow-up) for BSE knowledge, $F(2, 94) = 3.31$, $p = .041$ (refer to Figure 3). A paired samples $t$-test revealed that those in the individual condition experienced
Figure 2

**Repeated Measures MANOVA Results: Condition by Session Interaction for Breast Cancer Knowledge**

![Graph showing changes in Breast Cancer Knowledge over Pre-Test, Post-Test, and Follow-Up with Individual and Group comparisons.](image-url)
Figure 3

Repeated Measures MANOVA Results: Condition by Session Interaction for BSE

Knowledge

<table>
<thead>
<tr>
<th>Time</th>
<th>Individual</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-Up</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
a significant increase in BSE knowledge from pre-test \(M = 10.58\) to post-test \(M = 12.58\), \(t = -7.46, p = .00\). A second paired samples t-test revealed a significant decrease in BSE knowledge for those in the individual condition from post-test \(M = 12.46\) to follow-up \(M = 11.85\), \(t = 2.11, p = .04\). A paired samples t-test revealed that those in the group condition experienced a significant increase in BSE knowledge from pre-test \(M = 10.59\) to post-test \(M = 11.53\), \(t = -3.22, p = .00\). A second paired samples t-test revealed no significant difference in BSE knowledge for those in the group condition from post-test to follow-up.

Multivariate analysis of variance revealed a significant interaction of experimental condition (individual, group, and control) by session (pre-test and follow-up) for BSE frequency, \(F(2, 63) = 5.31, p = .007\) (refer to Figure 4). A paired samples t-test revealed that those in the individual condition significantly increased the frequency of their BSE from pre-test \(M = .96\) to follow-up \(M = 1.64\), \(t = -2.33, p = .03\). A mean score of .96 on BSE frequency at pre-test indicates individuals were practicing BSE once per year, whereas a mean score of 1.64 at follow-up is reflective of practicing BSE once or twice in the previous three months. Paired samples t-tests for the group and control condition revealed no significant differences in BSE frequency from pre-test to follow-up.

**Regression Results for TPB**

Pearson product moment correlations were used to investigate patterns of intercorrelations among all variables at pre-test, post-test, and follow-up (refer to Tables 5-7). Correlations were inspected to ensure that none of the predictors
Figure 4

Repeated Measures MANOVA Results: Condition by Session Interaction for Frequency of BSE

2.5 -
2 -
1.5 -
1 -
0.5 -
0 -

Pre-Test Follow-Up

--- Individual
--- Group
--- Control
Self-Identity: Subculture = Subjective Norms
Intention = Intention to Practice BSE
PB2 = PB (Personal Control); PB1 = PB (Barriers); PB = PB1
Note: All = BSE attitudes; BSEknow = Breast Cancer Knowledge; BSEfrequency = Frequent use of BSE

<table>
<thead>
<tr>
<th>Subculture</th>
<th>50</th>
<th>0.08</th>
<th>20</th>
<th>0.30</th>
<th>19</th>
<th>0.33</th>
<th>40</th>
<th>0.19</th>
<th>40</th>
<th>0.19</th>
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<tr>
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<td>15</td>
<td>0.39</td>
<td>37</td>
<td>0.04</td>
<td>46</td>
<td>0.04</td>
<td>37</td>
<td>0.04</td>
</tr>
<tr>
<td>SELF</td>
<td>46</td>
<td>0.15</td>
<td>15</td>
<td>0.39</td>
<td>37</td>
<td>0.04</td>
<td>46</td>
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<td>PB2</td>
<td>29</td>
<td>0.17</td>
<td>13</td>
<td>0.34</td>
<td>27</td>
<td>0.17</td>
<td>29</td>
<td>0.17</td>
<td>13</td>
<td>0.34</td>
</tr>
<tr>
<td>PB1</td>
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<td>0.19</td>
<td>19</td>
<td>0.39</td>
<td>26</td>
<td>0.19</td>
<td>35</td>
<td>0.19</td>
<td>19</td>
<td>0.39</td>
</tr>
<tr>
<td>Intent</td>
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<td>19</td>
<td>0.39</td>
<td>26</td>
<td>0.19</td>
<td>35</td>
<td>0.19</td>
<td>19</td>
<td>0.39</td>
</tr>
<tr>
<td>BSEfrequency</td>
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<td>0.19</td>
<td>19</td>
<td>0.39</td>
<td>26</td>
<td>0.19</td>
<td>35</td>
<td>0.19</td>
<td>19</td>
<td>0.39</td>
</tr>
<tr>
<td>BSEknow</td>
<td>23</td>
<td>0.02</td>
<td>02</td>
<td>0.10</td>
<td>02</td>
<td>0.10</td>
<td>23</td>
<td>0.02</td>
<td>02</td>
<td>0.10</td>
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</table>

Correlations Among Variables of Interest at Pre-Test

Table 3
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<tr>
<th>All</th>
<th>Bcknow</th>
<th>Bcknow</th>
<th>Intert</th>
<th>Intert</th>
<th>Bcknow</th>
<th>Bcknow</th>
<th>Intert</th>
<th>Intert</th>
<th>Bcknow</th>
<th>Bcknow</th>
<th>Intert</th>
<th>Intert</th>
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</thead>
<tbody>
<tr>
<td>0.6</td>
<td>0.22</td>
<td>0.22</td>
<td>0.16</td>
<td>0.16</td>
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<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Correlations Among Variables of Interest at Post-Test

Table 6
<table>
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<tr>
<th>All BSE knowledge</th>
<th>BSE knowledge</th>
<th>Frequency of</th>
<th>Frequency of</th>
<th>HPIC (Personal Control)</th>
<th>HPIC = HPIC (Personal Control)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: All = BSE attitudes, BSE = Breast Cancer Knowledge; BSE know = BSE knowledge; Freq = Frequency of</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>p &gt; .05. ** p &gt; .01.</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
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</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Correlations among Variables of Interest at Follow-Up

Table 7
Table 8

**Multiple Regression Analysis of TPB Variables Predicting Intent to Practice BSE**

at Pre-Test (N = 104)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Beta</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.53</td>
<td>.29</td>
<td>.05*</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>.02</td>
<td>.17</td>
<td>.02</td>
</tr>
<tr>
<td>Self-Identity</td>
<td>.21</td>
<td>.23</td>
<td>.03*</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>-.01</td>
<td>-.01</td>
<td>-.00</td>
</tr>
<tr>
<td>PBC (personal control)</td>
<td>.02</td>
<td>.02</td>
<td>.00</td>
</tr>
<tr>
<td>PBC (barriers)</td>
<td>-.08</td>
<td>-.09</td>
<td>-.00</td>
</tr>
</tbody>
</table>

R² = .37 **

Note: B = unstandardized regression coefficients; Beta = standardized regression coefficients.

* p < .05. ** p < .001
Table 9

**Multiple Regression Analysis of TPB Variables Predicting Intent to Practice BSE**

at Follow-Up (N = 66)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Beta</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.69</td>
<td>.48</td>
<td>.10 **</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>.00</td>
<td>.03</td>
<td>.03</td>
</tr>
<tr>
<td>Self-Identity</td>
<td>.18</td>
<td>.22</td>
<td>.04 *</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>.23</td>
<td>.20</td>
<td>.03</td>
</tr>
<tr>
<td>PBC (personal control)</td>
<td>-.02</td>
<td>-.01</td>
<td>-.00</td>
</tr>
<tr>
<td>PBC (barriers)</td>
<td>-.04</td>
<td>-.05</td>
<td>-.00</td>
</tr>
</tbody>
</table>

R² = .50 **

Note: B = unstandardized regression coefficients; Beta = standardized regression coefficients.

* p < .05. ** p < .001
were so highly intercorrelated ($r \geq .90$) as to pose a multicollinearity problem. In addition, intentions and BSE frequency were not significantly correlated at pre-test. This justifies conducting separate standard multiple regression analyses for these variables.

Standard multiple regression analyses were conducted to determine the extent to which TPB variables predicted intent at pre-test and follow-up. Attitude toward BSE and self-identity were both significant predictors of intentions to perform BSE at pre-test and follow-up. At pre-test, TPB variables collectively accounted for 37% of the variance in intent. Attitude and self-identity emerged as significant predictors of intent at pre-test accounting for 5%, and 3% of the unique variance respectively. At follow-up, TPB variables collectively accounted for 50% of the variance in intent. Attitude and self-identity were significant predictors of intent at follow-up accounting for 10%, and 4% of the unique variance respectively. Refer to Tables 8 and 9 for more details.

Standard multiple regression analyses were conducted to determine the extent to which TPB variables predicted frequency of BSE at pre-test and follow-up. At pre-test, 30% of the variance in frequency of BSE can be collectively accounted for by TPB variables. Self-identity was the only significant predictor of frequency of BSE at pre-test, accounting for 6% of the unique variance. At follow-up, 42% of the variance in frequency of BSE can be collectively accounted for by TPB variables. Attitude towards BSE was the only significant predictor of
frequency of BSE at follow-up, accounting for 18% of the unique variance. Refer to Tables 10 and 11 for more details.

**Tests of Hypotheses**

**Hypotheses Regarding Educational Interventions**

It was hypothesized that women who were exposed to the BSE intervention would be more likely to practice BSE in the future than women not exposed to a BSE intervention. This hypothesis was partially supported by the results in that those in the individual condition significantly increased their BSE frequency from pre-test to follow-up, whereas those in the group and control conditions did not.

It was also hypothesized that individual interventions would be more likely to influence future BSE practice than interventions delivered in a group setting. This hypothesis was also supported by the fact that those in the individual condition significantly increased their BSE frequency from pre-test to follow-up, whereas those in the group and control conditions did not.

**Hypotheses Based on the Theory of Planned Behaviour**

It was hypothesized that each of the TPB variables would make a unique contribution to the prediction of BSE practices. This hypothesis was partially supported. TPB variables collectively accounted for 30% of the variance in frequency of BSE at pre-test with self-identity emerging as the only significant predictor. Subjective norms, attitudes, PBC, self-efficacy did not emerge as
Table 10

**Multiple Regression Analysis of TPB Variables Predicting Frequency of BSE**

**Practice at Pre-Test (N = 104)**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Beta</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>-.03</td>
<td>-.01</td>
<td>-.00</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>.03</td>
<td>.17</td>
<td>.02</td>
</tr>
<tr>
<td>Self-Identity</td>
<td>.51</td>
<td>.32</td>
<td>.06 *</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>.26</td>
<td>.18</td>
<td>.02</td>
</tr>
<tr>
<td>PBC (personal control)</td>
<td>-.09</td>
<td>-.03</td>
<td>-.00</td>
</tr>
<tr>
<td>PBC (barriers)</td>
<td>-.16</td>
<td>-.10</td>
<td>-.00</td>
</tr>
</tbody>
</table>

$R^2 = .30 \text{ **}$

Note: $B =$ unstandardized regression coefficients; $Beta =$ standardized regression coefficients.

* $p < .05$. ** $p < .001$
Table 11

Multiple Regression Analysis of TPB Variables Predicting Frequency of BSE

Practice at Follow-Up (N = 66)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Beta</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>1.04</td>
<td>.62</td>
<td>.18 **</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>.00</td>
<td>.02</td>
<td>.00</td>
</tr>
<tr>
<td>Self-Identity</td>
<td>.10</td>
<td>.10</td>
<td>.00</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>.06</td>
<td>.05</td>
<td>.00</td>
</tr>
<tr>
<td>PBC (personal control)</td>
<td>-.07</td>
<td>-.05</td>
<td>-.00</td>
</tr>
<tr>
<td>PBC (barriers)</td>
<td>-.05</td>
<td>-.05</td>
<td>-.00</td>
</tr>
</tbody>
</table>

R² = .42 **

Note: B = unstandardized regression coefficients; Beta = standardized regression coefficients.

* p < .05. ** p < .001
significant predictors of BSE frequency at pre-test. TPB variables collectively accounted for 42% of the variance in frequency of BSE at follow-up, with attitude emerging as the only TPB variable accounting for a significant proportion of the unique variance in BSE frequency. Self-identity, subjective norms, PBC, and self-efficacy did not emerge as significant predictors of BSE frequency at follow-up.

It was also hypothesized that self-identity would account for a significant proportion of the variance in BSE behaviour once the other TPB variables had been accounted for. This hypothesis was partially supported as self-identity was the only TPB predictor that accounted for a significant proportion of the variance in frequency of BSE at pre-test.
Chapter IV
Discussion

Theory of Planned Behaviour Findings

One of the main reasons for conducting this research was to test the Theory of Planned Behaviour in its ability to predict BSE. The first question addressed in this study was, “do the established TPB variables (subjective norms, attitudes, intentions, perceived behavioural control, and self-efficacy) contribute significantly to the prediction of BSE behaviour?” It was hypothesized that each of these variables would make a unique contribution to the prediction of BSE practices. This hypothesis was partially supported by the results. TPB variables collectively accounted for 30% of the variance in frequency of BSE at pre-test. However, at pre-test self-identity was the only variable that emerged as a significant unique predictor. At follow-up, TPB variables collectively accounted for 42% of the variance in frequency of BSE. Attitude, however, was the only variable that accounted for unique variance.

The second question addressed was, “does self-identity predict BSE behaviour over and above the previously existing components of TPB?” It was hypothesized that self-identity would account for a significant proportion of the variance in BSE behaviour, once the other TPB variables had been accounted for. This hypothesis was partially supported by the finding that self-identity was the only variable that accounted for unique variance in predicting frequency of BSE
at pre-test. At post-test, however, self-identity failed to emerge as a significant predictor of BSE frequency.

Self-identity has been proposed as an extension of the subjective norm component of the TPB, and has been shown to predict intentions above the previously existing components of the TPB (i.e. attitudes, subjective norms, and perceived behavioural control; Armitage & Connor, 1999B). Beyond simply acting as an extension of the subjective norm component of TPB, the results of the present study indicate that self-identity is one of the strongest predictors of intentions to perform BSE. This finding is supported by research examining the predictability of the TRA (Armitage & Connor, 1999B). This research found that self-referent labelling predicted behaviour above attitudes and subjective norms (the original predictors in the TRA model). Self-referent labelling is a term used to describe the labels a person uses to describe her/himself. This definition is almost identical to the definition of self-identity: The extent to which an actor sees her/himself as fulfilling the criteria for a societal role (Connor & Armitage, 1998). The similarity between the two concepts is better illustrated with an example from the theory of planned behaviour questionnaire. An item designed to measure self-identity with regard to BSE reads: “I think of myself as someone who is aware of their breast health.”

Research also supports attitude toward BSE as being one of the strongest predictors of BSE behaviour. Results from a study done by Ronis and Kaiser (1989) indicate that attitude toward BSE and confidence in ability to perform BSE
directly influence BSE decisions. These researchers make the suggestion that attitudes toward BSE are generally positive, and thus inspiring confidence is more important in an intervention aimed at increasing BSE behaviour. The importance of inspiring confidence in women’s practice of BSE is inarguable. However, as indicated in the present study, attitudes toward BSE that are held by young women are not necessarily positive. Positively influencing attitudes toward BSE is very important when designing an educational intervention, especially with young women whose attitudes may not yet be fully formed.

Although not formally stated in the hypotheses, TPB variables were also used to predict intentions to perform BSE. It was found that, at pre-test, TPB variables collectively accounted for 37% of the variance in intent. At follow-up, TPB variables accounted for 50% of the variance in intent. The fact that TPB variables account for more variance in intent than in BSE practice is supported by the TPB model. In the model (see Figure 1) the three original predictors (i.e. attitude, subjective norms, and PBC) are direct predictors of intent, whereas intent is seen as the direct predictor of behaviour.

At both pre-test and follow-up, attitude and self-identity emerged as significant predictors of intention to perform BSE in the present study. There is a great deal of support for attitude as one of the most significant predictors of BSE intentions. For example, while examining the value of TPB in predicting intentions to perform several health-protective behaviours including breast self-examination, McCaul, Sandgren, O’Neill, and Hinsz (1993) found that attitude
was a better predictor of intentions to perform BSE than subjective norms, and perceived control was the best predictor of intentions overall. We did not find support for the predictability of perceived behavioural control, but this may be due to measurement error.

Godin and Kok (1996) have shown subjective norm to be the weakest predictor of intention in the TPB. While this could merely reflect the lesser importance of normative factors as determinants of intentions in the behaviours studied, a number of other explanations are possible. These include measurement problems and failure to tap the appropriate components of normative influence (Connor & Armitage, 1998).

**Issues in Measuring the Theory of Planned Behaviour**

In a study conducted by van Ryn, Lytle, and Kirscht (1996), TPB was used to predict two health behaviours: breast self-examination and exercise. They found that TPB variables significantly predicted BSE performance, whereas they did not significantly predict exercise. In light of this, it is possible that using TPB to predict a screening behaviour is different than using TPB to predict another health behaviour. The theory of planned behaviour questionnaire by Armitage and Connor (1999A) was originally developed for use in predicting healthy eating, and perhaps is not transferable to predicting a qualitatively different health behaviour.

Items designed to measure perceived behavioural control did not initially demonstrate internal consistency reliability. The PBC items did, however,
demonstrate reliability once they were separated into PBC items relating to external barriers to performing BSE (for example, "I do not have enough time to do BSE"), and PBC items relating to personal control (for example, "How much personal control do you feel you have over doing BSE?"). Alpha reliabilities remained relatively low for the items measuring barriers to performing BSE. This may reflect the length and verbal complexity of these three items.

Another source of possible measurement error is the addition of the 'not applicable' option for the subjective norms items asking about parents and partners. This option was added in the interest of sensitivity, but may have been misunderstood by participants. Although it is possible that 11% of the participants involved in the current study are without parents, this figure appears to be inflated. It seems logical to speculate that items designed to measure whether a person perceives that significant others think they should practice BSE would be difficult to answer. Unlike diet and exercise, breast self-examination is a topic that is rarely discussed in North American society (Phillips, Cohen, & Moses, 1999). Future researchers might address this problem by using more participant focused, discussion oriented research methods.

**Effects of Educational Interventions**

The second purpose of the present study was to examine the impact of teaching BSE using individualized and group interventions. This part of the study addressed two questions: "will exposure to an educational intervention, which includes information about BSE and a BSE demonstration, result in
increased practice of BSE?" and "do interventions delivered on a one-to-one basis result in greater practice of BSE than group interventions?" It was hypothesized that women who were exposed to a BSE intervention would be more likely to practice BSE in the future than women not exposed to a BSE intervention. More specifically, it was hypothesized that individual interventions would be more likely to influence future BSE practice than interventions delivered in a group setting. Results indicated that those in the individual condition significantly increased their BSE frequency from pre-test to follow-up. Unfortunately, those in the group and control conditions did not.

Although the difference is modest, the fact that those in the individual instruction condition subsequently practiced more BSE than those in the control (pamphlet only) condition is supported by research showing that individual instruction using an artificial breast model and professional feedback is more effective in promoting frequency and lump detection than a pamphlet or video-demonstration (Assaf, Cummings, Graham, Mettlin & Marshall, 1985).

Although there is no literature directly comparing the effects of individual and group BSE educational interventions, related research supports the finding that those in the group instruction condition did not significantly increase their BSE frequency after instruction. It might be attributed, in part, to the age of the women in the study. It is possible, as suggested by Cromer, Frankel, Hayes, and Brown (1992), that young women do not respond well to group instruction of BSE. Their study revealed a low rate of performing BSE amongst teenaged
women after having received group BSE instruction using a silicone breast model. The rate of BSE performance at the correct time during the menstrual cycle was low (12%) at a three-month follow-up, and ceased almost completely at an eight-month follow-up.

Although the material and breast models presented in both the individual and group interventions were identical, certain qualitative differences between the sessions did exist. In general, individual instruction took place at a slower rate. Participants in both groups were encouraged to ask questions, and to comment on the material being presented, but those in the individual condition were more inclined to do so. This is likely due to the privacy afforded by the individual intervention setting, as opposed to the classroom setting (occupied by other participants in the study) that was used during the group interventions.

Another difference between the individual and group intervention sessions was the decreased likelihood for those in the group condition to assume that the material presented was directed specifically at them. The perception of invulnerability is much more difficult when you are the only person to whom the information is being presented (as was the case in the individual intervention). Although not discussed in the context of this study, it should be noted that the Health Belief Model stresses personal susceptibility as a primary influence on health behaviours (Millar, 1997). That is, those who feel they are personally susceptible to suffering the risks of not practicing a particular health behaviour are more likely to engage in the behaviour. It is possible that women in the group
condition did not feel as personally susceptible to suffering breast health problems, and thus were less likely to engage in BSE.

Lauver (1989) found that 82% of women who received an individual intervention indicated at a three-month follow-up that they had performed BSE at least twice in the previous three months. This frequency of performing regular BSE was maintained at a six-month follow-up. An explanation that Lauver offers for the high rate of BSE frequency for women participating in her study is the fact that women volunteered, and were therefore at least moderately motivated to learn about and practice BSE. Women in the present study were not recruited on the basis of motivation to learn about BSE. Perhaps the lack of significant increase in BSE frequency for those in the group condition, and the mild increase in BSE frequency for those in the individual condition were indicative of this fact, in which case this study reflects a more realistic scenario of trying to educate the average woman to practice BSE.

While there were no formal hypotheses regarding the influence of the intervention on participants' knowledge of breast cancer and breast self-examination, interesting results with regard to increased knowledge did emerge. Participants in both the individual and group conditions experienced a significant increase in BSE and breast cancer knowledge from pre- to post-test. This increase was sharper for those in the individual condition, but knowledge significantly decreased from post-test to follow-up. For those in the group
condition, however, the more moderately increased level of BSE and breast cancer knowledge was maintained from post-test to follow-up.

As a consequence of the qualitatively different experiences of those in the individual and group conditions, it is speculated that those in the individual condition may have been more comfortable with the material. This would have led them to be less likely to review the material in the brochure after the session was over. Those participants in the group intervention condition may have been less sure of the material at the end of the session, and thus would have been more likely to refer to the brochure. Possible reasons for those in the group condition being less sure about the material include: distractions in the classroom setting such as art, other participants, the presence of a formal presenter, and overhead projection equipment at the front of the room. Further research is needed to determine the effects of reinforcement, and incorporating repeated BSE educational interventions.

Additional Findings on Young Women's Breast Health Practices

Findings during the pre-test indicated that, although 49% of participants reported they had been taught to practice BSE, only 5% were practicing it on a monthly basis. This finding is lower than average rates which are closer to 27-40% (Budden, 1995). At the three-month follow-up, 12% of women in the sample reported practicing monthly BSE. This finding is consistent with BSE research conducted with young women. Cromer and colleagues (1992) found that, after receiving group instruction, 12% of teenage participants practiced BSE on a
monthly basis. Unfortunately this rate of monthly BSE ceased almost completely at an eight-month follow-up.

Research by Budden (1995) indicates that the most commonly identified resource for obtaining BSE information is a doctor (42%), even though only roughly 17% of women indicate that they have actually received BSE instruction from a doctor. There appears to be a discrepancy between where women claim they are learning about BSE, and the extent to women perceive that health professionals are actually teaching proper BSE technique. A related discrepancy was found in the present study. Thirty-nine percent of women reported having had a clinical breast exam conducted in the past. Of these, 68% claim to have CBE done once per year. This finding indicates that many women are receiving positive messages regarding the importance of breast screening. However, when asked if they had ever been taught to do BSE according to a specific procedure, only 16% of women in this study reported that they had been taught to practice BSE by a health professional. It seems that while health professionals may be performing clinical breast examinations for their young patients, relatively few are taking the time to teach BSE procedure.

Limitations and Implications for Future Research

When interpreting the results of the present study, there are a few considerations which may be construed as limitations. The first category of limitations relates to methodology. Future researchers examining the ability of TPB to predict BSE may wish to avoid adapting Armitage and Connor's (1999A)
Theory of Planned Behaviour Questionnaire. Although the adapted version of this measure has face validity, and most sub-scales demonstrate internal consistency reliability, using a measure designed to predict a straightforward health behaviour to predict screening behaviours has yielded potential problems.

One must also keep in mind that all data used in the present study was self-report. The topic of breast self-examination is seen by many as being extremely personal. Paradoxically, it is also viewed by many as being a highly socially desirable behaviour. Although ensured of confidentiality, it is possible that some participants were not completely candid in their responses either because of the sensitive nature of the questions, or because they “knew” what the most desirable answers would be. Sole reliance on self-report data may have been a limitation in the present study. However, expanding data collection methods for research on BSE would be difficult due to the personal nature of the behaviour.

It is possible that using a more participant focused methodology would yield richer results than those that emerged from the present study. For example, based on previous research using a focus group methodology, it was found that breast cancer is seldom discussed within the African American community. This secrecy has lead to breast cancer being viewed as a “white woman’s disease,” and likely contributes to the fact that African American women are more likely to be diagnosed with breast cancer at a more advanced stage (Phillips, Cohen, & Moses, 1999). Incorporating a focus group methodology
and examining alternative teaching strategies should be considered by future researchers examining the breast health practices and beliefs of young women.

The two groups included in the group intervention condition were composed of 15 and 19 women. This group size was selected for the purpose of modeling the size of a typical high school class. Future researchers might consider trying to determine the optimal group size for teaching BSE. The results of the present study indicate that individual interventions are more effective in increasing BSE frequency, but it is possible that a smaller group size might have a similar effect.

The strength of conclusions that can be drawn from the present research are also limited by the study design, which included a three-month follow-up component. There was 63% rate of return for the study's follow-up component. The participants who did return were representative of the three experimental conditions, but the return rate was not optimal. It is possible that those who were the most motivated and interested in the research were the ones who agreed to return. This may have inflated results if those who did return were practicing BSE more frequently due to their interest in the subject. Sampling from a student population presents certain challenges including the difficulty of contacting, and re-contacting participants. Students may change their address and telephone number during a school year, or withdraw from school altogether. Thirty-three participants could not be contacted for the follow-up session. However, of the
104 participants who took part in the first part of the study, there were only 5 who refused to return for the follow-up session.

The second category of limitations is directly related to generalizability of results. A significant amount of research in the area of breast health has been conducted by academics in the nursing field, and has involved convenience sampling of nurses or nursing students (e.g. Budden, 1995; 1999; Cope, 1992; Kurtz, Given, Given, & Kurtz, 1993; Lauver, 1989). Women in the field of nursing come from a wide range backgrounds, but because of their unanimous interest in the field of health, it is difficult to generalize the findings of this research to more diverse populations. The present sample included women from a wide range of academic disciplines including psychology (40%), criminology (11%), nursing (6%), sociology (5%), social work (5%), English (5%), and 11 other disciplines on campus (28%). Despite the care taken to include participants from many different academic fields, generalizability of results is still limited by the fact that the sample was university based.

It is also difficult to generalize findings when samples are ethnically homogenous. Ethnic homogeneity is common when samples are drawn from university settings. The sample for this study was representative of ethnic diversity on the University of Windsor campus: 82% of participants self-identified as Caucasian, 10% self-identified as African or Jamaican Canadian, and 9% self-identified as other ethnic identities (i.e. Lebanese, South Asian, or Asian). Although there were not sufficient numbers to test for ethnic differences in BSE,
results do reflect a culturally diverse sample. As previously mentioned, studies sensitive to the cultural diversity within North America have yielded very important findings, including the fact that breast cancer is seldom discussed within the African American community. Future research is needed to specifically examine ethnic differences in BSE.

Conclusions

The current study makes an important contribution to the existing literature on TPB, and BSE education. Attitudes toward BSE, and having a positive breast health self-identity, were found to be the strongest predictors of BSE intentions and behaviour. This lends strong support for the formal inclusion of self-identity as a predictor of BSE. Although future research is needed directly comparing individual and group interventions for teaching BSE, this study is the first to suggest the superiority of teaching BSE to young women by way of an individualized intervention.

In conclusion, it became apparent during the course of this research that young women long to have voice with regard to their breast health. Many women who participated in the individual intervention expressed concerns and insightful thoughts pertaining to their breast health. One woman in the control condition wrote a comment on the questionnaire expressing her gratitude for being involved in this research. As a result of simply being asked about her breast health, she was motivated to examine her breasts, and as a result found a lump which is currently being monitored by her physician. This feedback was
inspiring, and it is hoped that this research has positively contributed to the breast health of all women involved.
References


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Appendix A

Background Information

Personal Identifier __________________________

1. Please indicate your age ______

2. At what level are most of your university courses this year?
   a) 1st year
   b) 2nd year
   c) 3rd year
   d) 4th year

3. What is the major area of concentration for your degree? __________________________

4. How would you describe your racial/ethnic identification? (E.g. South Asian, African-Canadian) __________________________

5. Have you ever discussed the topic of breast self-examination with anyone? Yes/No
   If yes, please indicate your relationship to the people with whom you have discussed BSE by circling all that apply.
   a) mother or step-mother
   b) sister
   c) aunt
   d) grandmother
   e) doctor
   f) nurse
   g) teacher
   h) friend
   i) boyfriend
   j) other __________________________

6. What is your primary source of knowledge about breast self-exams (if any)? __________________________

7. Were you ever taught to do BSE following a specific procedure? Yes / No
   If yes, who taught you to do BSE? (check all that apply)
   _____ Physician
   _____ Nurse
   _____ Other health professional
   _____ Self instructional booklet
   _____ Teacher
   _____ Parent
   _____ Friend
   _____ Other, please specify ______________
8. Have you ever practiced breast self-examination? Yes / No
   If yes, how often do you examine your breasts according to a specific procedure?
   a) Once a year or less often
   b) Once every 9-11 months
   c) Once every 6-8 months
   d) Once every 3-5 months
   e) Every 2 months
   f) Every month
   g) More than once a month

9. Have you ever had a clinical breast exam done by a health care professional? Yes / No
   If yes,
   a) What is the sex of the person who conducted your most recent clinical breast exam?
      Male / Female
   b) Do you have a preference as to the sex of the health care professional that performs your clinical breast exam?
      _____ Prefer male
      _____ Prefer female
      _____ No preference
   c) How often do you have clinical breast exams by a health care professional?
      _____ Each year
      _____ Every two years
      _____ Less than every two years

10. Do you have a family history of breast cancer? Yes / No / Not sure

11. Do you have a personal history of breast cancer or other breast health problems? Yes / No
   If yes, please explain

________________________________________________________________________
________________________________________________________________________
Appendix B

BSE and Breast Cancer Knowledge Questionnaire

Please indicate whether you think the following statements are true or false. (Adapted from Cope, 1992).

1. BSE involves inspecting one's breasts in front of a mirror as well as feeling the breast tissue for lumps. (True / False)

2. Palpation of breast tissue means using the middle three fingers of the hand to feel the breast tissue for lumps. (True / False)

3. The right hand is used to examine the right breast, and the left hand is used to examine the left breast. (True / False)

4. The best position for doing BSE is to lie on your back with a pillow under your head. (True / False)

5. It is normal to feel a firm ridge of tissue running horizontally below each nipple when doing BSE. (True / False)

6. Each breast should be examined by moving the fingers in a circular motion, in a circular pattern which covers the entire breast. (True / False)

7. The nipple should be checked for discharge only if a lump is found in that breast. (True / False)

8. The best time to examine your breasts for lumps is 2 weeks after your period. (True / False)

For the following questions, please check ONE response only from the list provided. (Adapted from Kurtz, Kurtz, Given, & Given, 1993).

1. How serious do you think the risk of breast cancer is for women?
   _____ Extremely serious
   _____ Very serious
   _____ Somewhat serious
   _____ Not very serious
   _____ Not at all serious
2. If you were to develop breast cancer, how probable do you think it is that it would have spread before it was discovered?

    _____ Not at all probable
    _____ Somewhat probable
    _____ Very probable
    _____ Extremely probable
    _____ Can’t predict

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

    _____ Women under age 50
    _____ Women over age 50
    _____ Age makes no difference
    _____ Don’t know

4. Could a woman have breast cancer without having any symptoms or feeling ill?

    _____ Yes
    _____ No
    _____ Don’t know

5. If a woman did not have any symptoms but she was 50 years of age or older, how often should she get a mammogram?

    _____ Every year
    _____ Every two years
    _____ Only when she has a problem/symptom
    _____ Don’t know

The following questions focus on early detection of breast cancer. Early detection means finding an abnormality in the early stages. For breast cancer, this means when the lump is small and has not spread to other areas of the body.
1. Once a person develops cancer, it is usually too late to do anything about it.
   _____ Strongly agree
   _____ Agree
   _____ Disagree
   _____ Strongly disagree
   _____ Don’t know

2. Early detection would improve one’s chances for cure of breast cancer
   _____ Strongly agree
   _____ Agree
   _____ Disagree
   _____ Strongly disagree
   _____ Don’t know

3. If you had a lump in your breast, how confident do you feel that you would be able to detect it?
   _____ Not at all confident
   _____ Somewhat confident
   _____ Quite confident
   _____ Extremely confident

4. How confident are you that a professional clinical breast examination could detect a lump in a woman’s breast?
   _____ Not at all confident
   _____ Somewhat confident
   _____ Quite confident
   _____ Extremely confident
Appendix C

Theory of Planned Behaviour Questionnaire
(Adapted from Armitage & Connor, 1999 - N.B. Sub-headings were removed on actual survey)

Intention

1. I intend to perform BSE in the future
   
   1 2 3 4 5 6 7
definitely do not definitely do

2. I plan to perform BSE in the future

   1 2 3 4 5 6 7
definitely do not definitely do

3. I want to do BSE in the future

   1 2 3 4 5 6 7
definitely do not definitely do

Attitude

1. My performing BSE next month is...

   1 2 3 4 5 6 7
good

   1 2 3 4 5 6 7
bad

   1 2 3 4 5 6 7
unfavourable

   1 2 3 4 5 6 7
favourable

   1 2 3 4 5 6 7
harmful

   1 2 3 4 5 6 7
beneficial

   1 2 3 4 5 6 7
pleasant

   1 2 3 4 5 6 7
negative

   1 2 3 4 5 6 7
enjoyable

   1 2 3 4 5 6 7
unenjoyable

   1 2 3 4 5 6 7
satisfactory

   1 2 3 4 5 6 7
unsatisfactory

   1 2 3 4 5 6 7
useful

   1 2 3 4 5 6 7
useless
For the following statements, please indicate whether the outcome stated is either likely or unlikely (circle one).

2. Doing BSE will let me detect abnormal breast tissue if it is there
   1 2 3 4 5 6 7
   unlikely likely

3. Doing BSE takes up too much of my time
   1 2 3 4 5 6 7
   disagree agree

4. By doing BSE I can monitor my own breast health
   1 2 3 4 5 6 7
   disagree agree

5. BSE is an awkward and uncomfortable
   1 2 3 4 5 6 7
   disagree agree

6. Doing BSE makes me conscious of my health
   1 2 3 4 5 6 7
   disagree agree

Subjective Norm

1. People who are important to me think I should...
   1 2 3 4 5 6 7
   not do BSE do BSE

2. People who are important to me would...
   1 2 3 4 5 6 7
   disapprove of my doing BSE approve of my doing BSE

3. People who are important to me want me to do BSE
   1 2 3 4 5 6 7
   strongly disagree strongly agree

4. I feel under social pressure to do BSE
   1 2 3 4 5 6 7
   strongly disagree strongly agree
5a. Health experts think I …

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5b. With regard to practicing BSE, how much do you want to do what health experts think you should?

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6a. My friends think I …

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6b. With regard to practicing BSE, how much do you want to do what your friends think you should?

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7a. My parents think I …

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7b. With regard to practicing BSE, how much do you want to do what your parents think you should?

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| Not applicable |

8a. The media thinks I …

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8b. With regard to practicing BSE, how much do you want to do what the media thinks you should?

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9a. My partner thinks I should not practice BSE

1 2 3 4 5 6 7

should Not applicable

9b. With regard to practicing BSE, how much do you want to do what your partner thinks you should?

1 2 3 4 5 6 7

not at all very much

10a. My family thinks I should not practice BSE

1 2 3 4 5 6 7

should Not applicable

10b. With regard to practicing BSE, how much do you want to do what your family thinks you should?

1 2 3 4 5 6 7

not at all very much

**Self-Efficacy**

1. To what extent do you see yourself as capable of doing BSE?

1 2 3 4 5 6 7

very incapable very capable

2. If it were entirely up to me, I am confident that I would be able to do BSE

1 2 3 4 5 6 7

strongly disagree strongly agree

For the following questions read the statement, and think about how much this factor influences whether or not you do BSE

3. To do BSE requires discipline

How likely is it that this belief will be a barrier to your practice of BSE?

1 2 3 4 5 6 7

less likely more likely

4. I don’t always know if my BSE is accurate

How likely is it that this belief will be a barrier to your practice of BSE?

1 2 3 4 5 6 7

less likely more likely
5. I do not have the skills I need to perform BSE
   How often does this factor inhibit your practice of BSE?
   
   1  2  3  4  5  6  7
   frequently  never

6. I am confident that I can perform BSE
   How often does this factor facilitate or influence your practice of BSE?
   
   1  2  3  4  5  6  7
   never  frequently

Perceived Behavioural Control

1. Whether or not I do BSE is entirely up to me
   
   1  2  3  4  5  6  7
   strongly disagree  strongly agree

2. How much personal control do you feel you have over doing BSE?
   
   1  2  3  4  5  6  7
   very little control  complete control

3. There are likely to be plenty of opportunities for me to do BSE
   
   1  2  3  4  5  6  7
   strongly disagree  strongly agree

4. How much do you feel that doing BSE is beyond your control?
   
   1  2  3  4  5  6  7
   very much so  not at all

For the following questions read the statement, and think about how much this factor influences whether or not you do BSE

5. I do not have enough time to do BSE
   How often does this factor inhibit your practice of BSE?
   
   1  2  3  4  5  6  7
   frequently  never

6. Doing BSE requires too many resources
   How likely is it that this belief will inhibit your practice of BSE?
   
   1  2  3  4  5  6  7
   less likely  more likely
7. Doing BSE is inconvenient

How likely is it that this belief will inhibit your practice of BSE?

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Self-Identity

1. I think of myself as a health conscious person.

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2. I think of myself as someone who is aware of their breast health.

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3. I think of myself as someone who is concerned about the consequences of neglecting my breast health.

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4. I think of myself as someone who enjoys taking care of their body.

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Appendix D

Post-Intervention and Follow-up Questionnaire
(Sub-headings were removed for the actual questionnaire)

Personal Identifier ____________________________

NOTE (for follow-up questionnaire only): For most of you this will be your mother’s maiden name, some people put their dog’s name or their student id. If you are not sure what you put last time, please write down all possibilities so I can match your answers! Thanks!

A/ Background Information (for follow-up questionnaire only)

1. Have you practiced BSE in the past three months (since the first part of this study took place in November)? Yes / No

   If Yes,
   How often have you examined your breasts according to a specific procedure since the first part of the study took place?
   a) Once
   b) More than once, but not every month
   c) Once a month (total of 3 times)
   d) More than once a month (total of more than 3 times)

2. Have you discussed your participation in this research with anyone since your initial participation in November? Yes / No

   If Yes,
   With whom did you discuss your participation in this research?

________________________________________________________________________

B/ BSE and Breast Cancer Knowledge Component

Please indicate whether you think the following statements are true or false.

1. BSE involves inspecting one’s breasts in front of a mirror as well as feeling the breast tissue for lumps. (True / False)

2. Palpation of breast tissue means using the middle three fingers of the hand to feel the breast tissue for lumps. (True / False)
3. The right hand is used to examine the right breast, and the left hand is used to examine the left breast. 
   (True / False)

4. The best position for doing BSE is to lie on your back with a pillow under your head. 
   (True / False)

5. It is normal to feel a firm ridge of tissue running horizontally below each nipple when doing BSE. 
   (True / False)

6. Each breast should be examined by moving the fingers in a circular motion, in a circular pattern which covers the entire breast. 
   (True / False)

7. The nipple should be checked for discharge only if a lump is found in that breast. 
   (True / False)

8. The best time to examine your breasts for lumps is 2 weeks after your period. 
   (True / False)

For the following questions, please check ONE response only from the list provided. (Adapted from Kurtz, Kurtz, Given, & Given, 1993).

1. How serious do you think the risk of breast cancer is for women?
   
   _____ Extremely serious
   _____ Very serious
   _____ Somewhat serious
   _____ Not very serious
   _____ Not at all serious

2. If you were to develop breast cancer, how probable do you think it is that it would have spread before it was discovered?
   
   _____ Not at all probable
   _____ Somewhat probable
   _____ Very probable
   _____ Extremely probable
   _____ Can’t predict
3. Who do you think is more likely to get breast cancer?
   _____ Women under age 50
   _____ Women over age 50
   _____ Age makes no difference
   _____ Don't know

4. Could a woman have breast cancer without having any symptoms or feeling ill?
   _____ Yes
   _____ No
   _____ Don't know

5. If a woman did not have any symptoms but she was 50 years of age or older, how often should she get a mammogram?
   _____ Every year
   _____ Every two years
   _____ Only when she has a problem/symptom
   _____ Don't know

The following questions focus on early detection of breast cancer. Early detection means finding an abnormality in the early stages. For breast cancer, this means when the lump is small and has not spread to other areas of the body.

1. Once a person develops cancer, it is usually too late to do anything about it.
   _____ Strongly agree
   _____ Agree
   _____ Disagree
   _____ Strongly disagree
   _____ Don't know
2. Early detection would improve one's chances for cure of breast cancer
   _____ Strongly agree
   _____ Agree
   _____ Disagree
   _____ Strongly disagree
   _____ Don't know

3. If you had a lump in your breast, how confident do you feel that you would be able to detect it?
   _____ Not at all confident
   _____ Somewhat confident
   _____ Quite confident
   _____ Extremely confident

4. How confident are you that a professional clinical breast examination could detect a lump in a woman's breast?
   _____ Not at all confident
   _____ Somewhat confident
   _____ Quite confident
   _____ Extremely confident

C/ Theory of Planned Behaviour Component

Please indicate your response by circling the appropriate number.

Intention

1. I intend to perform BSE in the future
   1 2 3 4 5 6 7
definitely do not
definitely do

2. I plan to perform BSE in the future
   1 2 3 4 5 6 7
definitely do not
definitely do
3. I want to do BSE in the future
   1 2 3 4 5 6 7
definitely do not
definitely do

Attitude

1. My performing BSE next month is...
   1 2 3 4 5 6 7
good
bad

   1 2 3 4 5 6 7
favourable
unfavourable

   1 2 3 4 5 6 7
beneficial
harmful

   1 2 3 4 5 6 7
unpleasant
pleasant

   1 2 3 4 5 6 7
positive
negative

   1 2 3 4 5 6 7
enjoyable
unenjoyable

   1 2 3 4 5 6 7
satisfactory
unsatisfactory

   1 2 3 4 5 6 7
useful
useless

For the following statements, please indicate whether the outcome stated is either likely or unlikely (circle one).

2. Doing BSE will let me detect abnormal breast tissue if it is there
   1 2 3 4 5 6 7
unlikely
likely

3. Doing BSE takes up too much of my time
   1 2 3 4 5 6 7
disagree
agree

4. By doing BSE I can monitor my own breast health
   1 2 3 4 5 6 7
disagree
agree
5. BSE is an awkward and uncomfortable
   
   1 2 3 4 5 6 7
   disagree
   7 6 5 4 3 2 1
   agree

6. Doing BSE makes me conscious of my health
   
   1 2 3 4 5 6 7
   disagree
   7 6 5 4 3 2 1
   agree

Subjective Norms (for follow-up questionnaire only)

1. People who are important to me think I should...
   
   1 2 3 4 5 6 7
   not do BSE
   7 6 5 4 3 2 1
   do BSE

2. People who are important to me would...
   
   1 2 3 4 5 6 7
   disapprove of my doing BSE
   7 6 5 4 3 2 1
   approve of my doing BSE

3. People who are important to me want me to do BSE
   
   1 2 3 4 5 6 7
   strongly disagree
   7 6 5 4 3 2 1
   strongly agree

4. I feel under social pressure to do BSE
   
   1 2 3 4 5 6 7
   strongly disagree
   7 6 5 4 3 2 1
   strongly agree

5a. Health experts think I...
   
   1 2 3 4 5 6 7
   should not practice BSE
   7 6 5 4 3 2 1
   should practice BSE

5b. With regard to practicing BSE, how much do you want to do what health experts think you should?
   
   1 2 3 4 5 6 7
   not at all
   7 6 5 4 3 2 1
   very much

6a. My friends think I...
   
   1 2 3 4 5 6 7
   should not practice BSE
   7 6 5 4 3 2 1
   should practice BSE
6b. With regard to practicing BSE, how much do you want to do what your friends think you should?

1 2 3 4 5 6 7
not at all very much

7a. My parents think I ... should not practice BSE

1 2 3 4 5 6 7 should practice BSE

7b. With regard to practicing BSE, how much do you want to do what your parents think you should?

1 2 3 4 5 6 7 not at all very much

8a. The media thinks I ... should not practice BSE

1 2 3 4 5 6 7 should practice BSE

8b. With regard to practicing BSE, how much do you want to do what the media thinks you should?

1 2 3 4 5 6 7 not at all very much

9a. My partner thinks I ... should not practice BSE

1 2 3 4 5 6 7 should practice BSE

9b. With regard to practicing BSE, how much do you want to do what your partner thinks you should?

1 2 3 4 5 6 7 not at all very much

10a. My family thinks I ...

1 2 3 4 5 6 7 should not practice BSE

9b. With regard to practicing BSE, how much do you want to do what your family thinks you should?

1 2 3 4 5 6 7 not at all very much
Self-Efficacy
1. To what extent do you see yourself as capable of doing BSE?
   1 2 3 4 5 6 7
   very incapable very capable
2. If it were entirely up to me, I am confident that I would be able to do BSE
   1 2 3 4 5 6 7
   strongly disagree strongly agree

For the following questions read the statement, and think about how much this factor influences whether or not you do BSE

3. To do BSE requires discipline
   How likely is it that this belief will be a barrier to your practice of BSE?
   1 2 3 4 5 6 7
   less likely more likely
4. I don't always know if my BSE is accurate
   How likely is it that this belief will be a barrier to your practice of BSE?
   1 2 3 4 5 6 7
   less likely more likely
5. I do not have the skills I need to perform BSE
   How often does this factor inhibit your practice of BSE?
   1 2 3 4 5 6 7
   frequently never
6. I am confident that I can perform BSE
   How often does this factor facilitate or influence your practice of BSE?
   1 2 3 4 5 6 7
   never frequently

Perceived Behavioural Control
1. Whether or not I do BSE is entirely up to me
   1 2 3 4 5 6 7
   strongly disagree strongly agree

2. How much personal control do you feel you have over doing BSE?
   1 2 3 4 5 6 7
   very little control complete control
3. There are likely to be plenty of opportunities for me to do BSE

   1  2  3  4  5  6  7
strongly disagree  strongly agree

4. How much do you feel that doing BSE is beyond your control?

   1  2  3  4  5  6  7
very much so  not at all

For the following questions read the statement, and think about how much this factor influences whether or not you do BSE

5. I do not have enough time to do BSE

   How often does this factor inhibit your practice of BSE?

   1  2  3  4  5  6  7
frequently  never

6. Doing BSE requires too many resources

   How likely is it that this belief will inhibit your practice of BSE?

   1  2  3  4  5  6  7
less likely  more likely

7. Doing BSE is inconvenient

   How likely is it that this belief will inhibit your practice of BSE?

   1  2  3  4  5  6  7
less likely  more likely

Self-Identity

1. I think of myself as a health conscious person.

   1  2  3  4  5  6  7
strongly disagree  strongly agree

2. I think of myself as someone who is aware of their breast health.

   1  2  3  4  5  6  7
strongly disagree  strongly agree

3. I think of myself as someone who is concerned about the consequences of neglecting my breast health.

   1  2  3  4  5  6  7
strongly disagree  strongly agree

4. I think of myself as someone who enjoys taking care of their body.

   1  2  3  4  5  6  7
strongly disagree  strongly agree
Appendix E

Consent Form: Control Condition

The purpose of this study is to examine health practices of university-aged women. During this session you will be asked to fill out a questionnaire, which should take no longer than 20 minutes to complete.

This is a two part study, with a follow-up component in three months. If you feel that you will not be able to participate in the follow-up component, you are asked to withdraw from this study before this session begins without penalty. The follow-up component will take approximately 20 minutes to complete and you will be awarded one bonus point for participating next semester.

There are no anticipated risks of participating in this research. Your participation is completely voluntary. You have the right to withdraw from participation in the study, or to refrain from answering any questions at any point without penalty.

You will be awarded one research bonus point for participating in this component of the study.

If you wish to see a final report of this study, a copy will be available from the Secretary to the Department Head of the University of Windsor Department of Psychology by July, 2001. This study has been approved by the Ethics Committee of the Psychology Department, University of Windsor. If you have any questions, please contact:

Carie Stewart (Principal Investigator) 253-3000 ext. 2217
Dr. Kathryn Lafreniere (Research Supervisor) 253-3000 ext. 2233
Dr. Stewart Page (Chair, Psychology Department Ethics Committee) 253-3000 ext. 2243

Thank you for participating.

Tear here and keep the top portion, return the bottom to the researcher.

There is a second phase to this research which is necessary to obtain meaningful results for this study. To be contacted next semester for the follow-up study, please indicate your present and permanent (parents) telephone numbers. Email address is optional.

I understand that the information obtained from me will be kept completely confidential, and that I may withdraw at any time from participation.

_________________________  ________________________
Signature                  Date

_________________________  ________________________  ________________________  ________________________
Print Name      Present Telephone No.  Permanent Telephone No.  Email Address
Appendix F

All Oral Instructions for Participants

Before Main Questionnaire is Distributed (Experimental Conditions)

- The following questionnaire should take approximately 20 minutes to complete (10 minutes for follow-up session). If you have any questions while filling it out please don’t hesitate to ask. This entire session will take a maximum of 90 minutes to complete. In the personal identifier space at the top of the questionnaire, please put your mother’s maiden name or any other identifier you will easily remember. This is so I can keep track of matching up your answers across questionnaires, without linking your name to your responses.

- A brief breast self-examination workshop will take place after this questionnaire is complete. This will take approximately 30 minutes. If anyone needs to leave the room to use the washroom, please do so before the workshop begins.

Before Main Questionnaire is Distributed (Control Condition)

- The following questionnaire should take approximately 20 minutes to complete. If you have any questions while filling it out please don’t hesitate to ask. In the personal identifier space at the top, please put your mother’s maiden name or any other identifier you will easily remember. This is so I can keep track of matching up your answers across questionnaires, without linking your name to your responses.
After BSE Workshop (Experimental Conditions only)

- Please fill out the following questionnaire, it should take less than 10 minutes to complete. If there are any questions please do not hesitate to ask. Raise your hand when you are finished completing the questionnaire and I will come around and collect it. Please stay for the debriefing session afterwards, this will take approximately 5 minutes.

For Follow-up Session (All Conditions)

- Please fill out the following questionnaire, it should take less than 20 minutes to complete. If you have any questions about this questionnaire or anything else pertaining to this study, please do not hesitate to ask. For the personal identifier at the top, please use the same one that you used for the first part of this study last semester. At that time I recommended using your mother's maiden name. This is so I can match your responses without identifying who you are. Raise your hand when you are finished completing the survey and I will come around to collect it. Please stay for the debriefing session, which will take approximately 5 minutes.
Appendix G

Debriefing Materials: First Session - All Conditions

1. Oral debriefing:

For this study we are interested in learning about young women's attitudes toward their breast health. As mentioned during the informed consent section of this session, the follow-up component of the study is crucial for obtaining meaningful results. Hopefully everyone will be available to attend the follow-up session next semester. I will be making telephone calls to set up appointments in approximately three months. If participation is low for the follow-up, the results obtained during this session will not be very useful for my research. Please refrain from discussing your participation in this research with friends at this University until after the follow-up component is complete. As you know many undergraduate students are selected for participation in research, and discussing this project with them may contaminate the results.

Thank you very much for participating in this study. The top portion of the consent form is for you to keep and it has my name and telephone number on it, as well as that of my research supervisor. Feel free to call either of us if you have questions or concerns about the study. I am conducting a follow-up session for this study approximately three months from now. If you have left your telephone number on the consent slip, I will contact you to participate in the follow-up. At this second session you will be eligible for one bonus point to be awarded next semester. If you are not enrolled in a class that awards bonus
points for research next semester, you will receive a coupon that is redeemable the next time you take a class which awards bonus points for research.

I have put together a thank-you/information package for each of you which includes BSE reminder stickers that you can use on your pill pack if you use oral contraceptives, or in your day planner. The brochure is from the Canadian Cancer Society and includes reference information that we covered today.

The BSE reminder stickers

The Canadian Cancer Society Pamphlet

2. Contact Sheet Information

- Contact information for the primary researcher, research supervisor, and ethics committee chairperson is available on the top portion of the consent form which you may keep for your records.
- **Canadian Cancer Society (Windsor):**
  
  250 Tecumseh Rd. E.
  
  Windsor, ON N8X 2R3
  
  (519) 254-5116
- **Ontario Breast Screening Program (Windsor):**
  
  Walker Rd Centre, Walker Plaza 1200
  
  1275 Walker Rd, Unit 10
  
  Windsor, ON N8Y 4X9
  
  (519) 253-0903
- **Medical & Health Services (University of Windsor campus):**
  
  Student Centre (CAW) - 2nd floor
  
  Open 9:00 am to 5:00 pm, Monday to Friday
  
  (519) 973-7002 (or ext. 7002 on campus)
Appendix H

Oral Debriefing: Follow-up Session - All Conditions

Thank you very much for participating in this study. The purpose of this study was to determine whether experiencing an individual BSE education session or a group BSE education session would lead to differences in BSE learning and practice. A control group was included for this study, so some participants did not listen to information about breast cancer and BSE, or practice BSE using the silicone breast model. These participants received a brochure about BSE, and were only awarded one bonus point last semester because without the educational component the session did not last nearly as long.

If you are interested in the results of this study, they will be available from the Secretary to the Department Head of the University of Windsor Department of Psychology by July, 2001.

If anyone has questions about this research that they would like to ask, feel free to ask me now or contact me by phone or email. During the first session for this study each person was given a packet of BSE reminder stickers and a BSE pamphlet from the Canadian Cancer Society. If you would like more of these materials, please contact me.
Appendix I

Consent Form: Experimental Conditions

The purpose of this study is to examine attitudes toward breast health among young women. For this session, you will be asked to fill out a questionnaire, which should take no longer than 20 minutes to complete. After this questionnaire is filled out, you will be asked to stay for a workshop in which you will be taught proper procedures for breast self-examination (25 minutes). There will be another short survey administered after the workshop (15 minutes). In total this component of the study is expected to take a maximum of ninety minutes of your time.

This is a two part study, with a follow-up component in three months. If you feel that you will not be able to participate in the follow-up component, you are asked to withdraw from this study before this session begins without penalty. The follow-up component will take approximately 20 minutes to complete and you will be awarded one bonus point for participating next semester.

There are no anticipated risks of participating in this research. Your participation is completely voluntary. You have the right to withdraw from participation in the study, or to refrain from answering any questions at any point without penalty.

You will be awarded TWO research bonus points for participating in this component of the study.

If you wish to see a final report of this study, a copy will be available from the Secretary to the Department Head of the University of Windsor Department of Psychology by July, 2001.

This study has been approved by the Ethics Committee of the Psychology Department, University of Windsor. If you have any questions, please contact:

Carie Stewart (Principal Investigator) 253-3000 ext. 2217
Dr. Kathryn Lafreniere (Research Supervisor) 253-3000 ext. 2233
Dr. Stewart Page (Chair, Psychology Department Ethics Committee) 253-3000 ext. 2243

Thank you for participating.

Tear here and keep the top portion, return the bottom to the researcher.

There is a second phase to this research which is necessary to obtain meaningful results for this study. To be contacted next semester for the follow-up study, please indicate your current and permanent (parents) telephone number. Email address is optional.

I understand that the information obtained from me will be kept completely confidential, and that I may withdraw at any time from participation.

__________________________  __________________________
Signature                  Date

__________________________  __________________________
Print Name                  Present Telephone No.

__________________________  __________________________
Permanent Telephone No.     Email Address
Appendix J

BSE Workshop: Content of Overheads
(Information adapted from: Canadian Cancer Society pamphlet "About Breast Health";
and BSE Workshop presented on Oct. 16, 2000 at Ontario Breast Screening Program – conducted by Lori
Del Duca, N.E.)

1. What is Breast Health?
   • Breast health starts with you knowing your own breasts. That way you are
     more likely to recognize changes. Most breast problems can be treated if
     they are discovered early enough. It is one area in your life where you can
     take control.

2. What is Breast Screening?
   There are three things you can do to care for your breasts:
   • Clinical breast exam by a health professional (once a year)
   • Breast Self-Examinations (once a month)
   • Mammography (every two years after age 50)

3. Facts about Breast Cancer
   • Breast cancer is one of the leading causes of cancer deaths in women.
   • The average woman in Ontario has a 1 in 9 chance of developing breast
     cancer in her lifetime.
   • It is estimated that in 1998, 7600 Ontario women developed breast cancer,
     and 2000 died from it.
   • A woman’s risk of developing breast cancer increases with age. There are,
     however, cases of women developing breast cancer as early as in their 20s.
   • There is no way yet known how to prevent breast cancer.
   • Early detection of breast cancer may save many lives, because small breast
     cancers have the highest chance of being cured.
4. Risk Factors for Developing Breast Cancer

- Being a woman
- Increasing age
- Country of birth
- Family history
- Previous breast cancer
- Breast density (over 75% density of glandular tissue)
- Early menarche (under 12)
- Late menopause (over 55)
- Late first pregnancy (over 30) or no children

BUT, 70% of women who develop breast cancers have no risk factors

5. Some Reasons Women Give for not doing BSE

- Afraid of finding “something”
- Not knowing what to look for
- Forgetting
- Not enough time

6. Who Should do BSE and When?

The Canadian Cancer Society recommends that every woman 20 years of age or older should practice monthly BSE. For women who are still menstruating (i.e. not menopausal), BSE should be done 7-10 days after the first day of your period. The reason for this is that breast tissue changes as your hormones change throughout your menstrual cycle. In order to detect abnormalities, we need to know what “normal” breast tissue is for us. If you are just beginning to learn about and practice BSE, it is recommended that you practice the procedure 3 or 4 nights in a row to get used to how to do it properly, and recognize what is normal for you.
7. Components of Practicing Breast Self-Examination

a) Visual Inspection

- Do this by looking in a well lit mirror. Look for any changes in your breasts from the collar bone to the middle of your breast plate, down to your last ribs, and the area underneath your arm pit.
- This inspection should be done in three positions: with arms at your side, above your head, and with your hands pushing down on your hips.
- Look for changes in: size, shape, or contour; skin texture (dimpling/puckering, new dilated and prominent veins, red, hot, or inflamed skin, orange peel texture with prominent pores); changes in nipple such as an eczema-like rash, retracted or inverted nipple, discharge or lumps.

b) Palpation (in a circular motion)

- This manual inspection should be done in three positions: Upright; on your side lying down; and on your back lying down. The reason for doing it in all three positions is that at each position the breast is flattened in a different area.
- The check in the upright position can be done in the shower with soapy fingers for easier gliding. When you are on your back, place a pillow behind the shoulder of the breast you are checking so it doesn’t move to the side.
- Use the pads of the middle three fingers of the opposite hand to apply a constant, firm pressure. Do not use your finger tips! Use the opposite hand of the breast you are checking. Raise your arm (beside the breast you are checking) above your head.
- Use a clock as a guide. Using circular, nickel size strokes feel from the outside of the breast to the nipple for every number on the clock. Make sure to feel the nipple every time.
- The majority of glandular breast tissue is on the outer half of the breast. The majority of breast cancer is found on the upper outer quarter of the breast, and around 20% of breast cancer is found in the middle of the breast.

8. More information:

- Most breast lumps are not cancer
- A healthy diet may decrease your risk of breast cancer, but there is no absolute proof.
- Women can have breast cancer without feeling ill.
- There are lumps that can be seen and not felt, felt and not seen, and lumps that can be seen and felt.
- Most breast lumps are not found by doctors. They are found by women, either by accident or when doing BSE.
- Breast self-examination takes about 10 minutes per month so "not having enough time" is not an excuse.
- If there is a firm ridge of tissue at the bottom edge of the nipple that is normal for you, do not panic this is normal for some women.
- If your breasts are large, they may fold down on your chest. This fold may feel like a firm ridge. Do not panic. This ridge is normal for larger breasts.

Demonstrated procedure using silicone breast model (borrowed from Nursing Department). Passed breast models around allowing everyone a chance to feel for the lump.
Vita Auctoris

Carie Stewart was born in 1976 in Port Colborne, Ontario. She graduated as an Ontario scholar from Port Colborne High School in 1995. From there she went on to the University of Guelph (Ontario) where she graduated with distinction with a B.A. in Psychology in 1999. She is currently a candidate for the Master’s degree in Applied Social Psychology at the University of Windsor and hopes to graduate in June, 2001.