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**PREDICTING AND FACILITATING UPWARD FAMILY
COMMUNICATION AS A MAMMOGRAPHY
PROMOTION STRATEGY**

A thesis submitted in fulfilment of the
requirements for the award of the degree

Doctor of Philosophy

from the

University of Wollongong

By

Jessica L. Browne

B.Psyc(Hons)

School of Psychology

Faculty of Health and Behavioural Sciences

2010

Certification

I, Jessica L. Browne, declare that this thesis, submitted in fulfillment of the requirements for the award of Doctor of Philosophy, in the School of Psychology, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Jessica L. Browne

6th May 2010

Abstract

Breast cancer is the second most common cause of cancer-related death amongst Australian women. Regular screening mammography is the best way to facilitate early detection of breast cancer, which in turn increases the chances of survival. Although BreastScreen Australia offers free biennial mammograms to women aged 40 and above (particularly targeting women between the ages of 50-69), many eligible women fail to attend for regular mammography. Mass media campaigns that have aimed to promote mammography to eligible women have not been sufficient to raise the mammography screening rate from the current 57.1% to the target 70%.

The central premise of this thesis is that interpersonal influence may complement the mass media approach to mammography promotion, and serve to increase the national screening rate. In particular, in light of previous research that has identified the family has as a potential vehicle for delivering health promotion messages, the potential role that a daughter could play in influencing her mother's health behaviour was given particular attention in the current project. Everyday interpersonal communication initiated by the daughter directed at the mother is referred to as 'upward family communication' in this thesis. Upward family communication about mammography is a novel approach to mammography promotion, and the purpose of the research presented in this thesis was to explore the viability of this strategy.

Family Communication Patterns theory describes four family types based on two dimensions: the conversation orientation and the conformity orientation. This theoretical framework is used in the current project to inform predictions about upward family communication about mammography, particularly in relation to identifying which mother-daughter dyads are likely to engage in such communication effectively. The Revised Family Communication Patterns (RFCP) instrument, used to classify families according to type, was modified as part of the current project for use specifically with mother-daughter dyads. Tailoring the instrument for use specifically with mother-daughter dyads has not previously been attempted, and the data from this project indicate that the internal consistency of the instrument was not compromised in this process. Semi-structured interviews were conducted with eight mother-daughter pairs to explore the nature of existing communication patterns within this relationship, and the modified RFCP instrument was able to differentiate between mother-daughter dyads with different communication patterns. The data from these interviews indicate

that while upward family communication about health is commonplace within these dyads, mammography is not likely to be a spontaneous topic of conversation initiated by daughters.

Thus, two daughter-targeted interventions were piloted that aimed to predict and facilitate upward family communication about mammography. With the Theory of Planned Behaviour (TPB) providing the theoretical background, a volitional intervention using implementation intentions and a motivational intervention using counterfactual thinking were piloted with independent samples. These studies represent the first attempts at using the TPB to predict and facilitate upward family communication about mammography and at applying implementation intentions and counterfactual thinking to this communication behaviour. Young women who participated in the implementation intention (volitional) intervention were significantly more likely to have initiated a conversation with their mothers about mammography within an eight-week period than controls ($N = 116$). In contrast, young women who participated in the counterfactual thinking (motivational) intervention were no more likely to have initiated the specified conversation than controls ($N = 131$). In both studies, the TPB variables predicted both intention and behaviour with some accuracy, thus contributing to the body of knowledge about the utility of this theoretical model. Notably, in both studies, young women reported that initiating a conversation about mammography with their mother had positive consequences, such as increases in knowledge, and an elevated likelihood that their mother would have a mammogram. This result provided evidence for daughters' willingness to engage in an upward family communication mammography promotion strategy, and for the effectiveness of this novel approach.

The primary contribution of the project presented in this thesis is the provision of convergent evidence for the viability and effectiveness of an upward family communication strategy to promote mammography to target women. The current project has also presented a means for identifying mother-daughter dyads most amenable to this novel mammography promotion approach using the predictions of Family Communication Patterns Theory. Further, the results of this project have demonstrated that the TPB model has utility for predicting upward family communication about mammography, and has potential for guiding interventions aimed at facilitating this behaviour.

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Undertaking this PhD has provided many opportunities for self-examination and growth. One particular way in which I have developed is in my understanding of my God-given passions and gifts, and how the life of an academic allows the expression of

these. So at the risk of sounding as though I am delivering a speech at the Oscars, I'd like to thank God for this opportunity, and for the personal refining that has resulted.

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List of Abbreviations

AIHW	Australian Institute of Health and Welfare
BSE	Breast Self-Examination
CBE	Clinical Breast Examination
CFT	Counterfactual Thinking
FCP	Family Communication Patterns
HAPA	Health Action Process Approach
HBM	Health Belief Model
II	Implementation Intentions
NBOCC	National Breast and Ovarian Cancer Centre
RFCP	Revised Family Communication Patterns
SCM	Social Cognitive Model
SCT	Social Cognitive Theory
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TTM	Transtheoretical Model

1 Introduction

This thesis presents the findings of a research project that explored the feasibility of a novel mammography promotion strategy. For the most part, the behaviour change theory and strategies employed for this project are decidedly psychological. However, research from a range of disciplines including family communication, health communication, and epidemiology, as well as health, social, and cognitive psychology has informed the development and implementation of the project presented in this thesis. As such, this research has a distinct multi-disciplinary flavour.

The National Breast Cancer Foundation (NBCF) has called for future research to focus on the effective communication of the risk of breast cancer, and the role of psychological variables in cancer prevention, communication, and treatment (NBCF, 2003). The research outlined in this thesis aims in part to answer this call by focussing on family communication as the vehicle and context for psychological interventions to promote screening mammography to target women (defined by BreastScreen Australia as women aged 50-69). This approach to mammography promotion is a novel alternative to other established strategies such as mass media campaigns and physician education.

1.1 Research Aims

Broadly, the purpose of the current research was to explore the potential for young women to engage in mammography promotion interventions that involve them communicating with their older female family members (primarily their mothers) about mammographic screening. The notion that everyday communication between mother and daughter might be harnessed so that the daughter may influence her mother's preventive health behaviour was informed by the Family Communication Patterns theory. The current project involved the use of both qualitative and quantitative methods with the aim of providing convergent evidence for what I have termed an 'upward' family communication strategy to promote mammography to women eligible for free biennial screening mammography through BreastScreen Australia. The current project also involved designing and piloting theory-based strategies that targeted young women with the aim of facilitating this upward family communication. Three broad aims guided this research:

1. To examine the viability of an upward family communication strategy to promote mammography to target women, against the theoretical backdrop of Family Communication Patterns theory;
2. to use the Theory of Planned Behaviour to examine predictors of upward family communication about mammography; and
3. to trial a volitional and a motivational intervention, each designed to supplement the Theory of Planned Behaviour model and facilitate upward family communication about mammography.

Four studies were implemented in order to address these three aims. Section 1.2 comprises a brief description of each of the introductory and review chapters, followed by an outline of these four studies.

1.2 Outline of Chapters

Chapter 2 introduces the public health problem of breast cancer, and makes a case for mammography as the best available early detection technique. This chapter also reports on Australia's population-based screening program, including the participation rate, and the program's effectiveness in reducing the breast cancer mortality rate. In particular, this chapter highlights that many women do not adhere to the mammography screening guidelines. Known barriers and facilitators to mammography are also discussed.

Chapter 3 compares and contrasts the effectiveness of mass media and interpersonal communication preventive health promotion initiatives. Previous interventions that have effectively harnessed interpersonal communication and influence to promote mammographic screening are discussed in some detail.

Following this, **Chapter 4** looks specifically at interpersonal communication between family members as a possible vehicle for health promotion. This chapter also outlines the Family Communication Patterns theory, which provides a rationale for studying upward family communication. Particular attention is given to health-related research with mother-daughter dyads that has recently been undertaken in non-Australian contexts.

The role of social cognition in behaviour change, particularly health behaviour change, is explored in **Chapter 5**. Several prominent theories of health behaviour change are outlined and critiqued, and a case is made for using the Theory of Planned

Behaviour to predict and explain upward family communication about mammography. Some common criticisms of the Theory of Planned Behaviour are addressed and implementation intentions and counterfactual thinking are both introduced as strategies that may supplement the Theory of Planned Behaviour, and assist in facilitating the desired behaviour change.

Chapter 6 reports on two separate but related studies that explored the nature of mother-daughter communication patterns. Study 1A introduces a modified version of the Revised Family Communication Patterns scale for use with mother-daughter dyads, and provided preliminary evidence that this instrument is valid. Study 1B involved interviewing mother-daughter dyads, as well as administering the modified Revised Family Communication Patterns scale. Content analysis was conducted both manually and using a computer program to explore patterns of communication that exist between mothers and their adult daughters.

Chapter 7 presents Study 2, a pilot intervention that applied the Theory of Planned Behaviour to upward family communication about mammography, and trialled the use of implementation intentions with the aim of facilitating this behaviour.

Chapter 8 reports on a similar pilot intervention study that assessed the usefulness of a CF thinking strategy to motivate young women to initiate upward family communication about mammography.

Finally, **Chapter 9** integrates and summarises the main results of the studies, and discusses the findings in light of the three aims of the project. Further consideration is given to the main themes of the project, and practical applications of the current research are also discussed.

The ensuing chapters develop an argument for, and present evidence for the viability of a novel approach to mammography promotion: utilising upward family communication as a means of delivering mammography promotion messages to target women. This approach has been informed by Family Communication Patterns theory in the current project. The research presented in this thesis also demonstrates that the Theory of Planned Behaviour has utility for predicting upward family communication about mammography, and has potential for guiding interventions aimed at facilitating this behaviour.

2 Breast Cancer and Mammography

Breast cancer is a significant health problem in Australia. It is the most common cancer diagnosed in Australian women, and second most common cause of cancer-related death for Australian women, exceeded only by lung cancer (Australian Institute of Health and Welfare [AIHW] & National Breast and Ovarian Cancer Centre [NBOCC], 2009). These patterns of incidence and mortality are comparable with those in the United Kingdom and in the United States. In Australia, one in nine women will be diagnosed with breast cancer before the age of 85; with 69 percent of these cases occurring in women aged 40-69 (AIHW & NBOCC, 2009). Many risk factors for developing breast cancer have been identified e.g., having a first degree relative with breast cancer, possessing the BRAC1/BRAC2 gene mutation, previous breast disease, early onset of menarche, no pregnancy or first full term pregnancy after age 40, elevated alcohol intake, being overweight (see Henderson, 1993; McCredie, Dite, Giles, & Hopper, 1998; McPherson, Steel, & Dixon, 2000; Sprague et al., 2008). However, the single most important risk factor is being a woman over 50. While advances in treatment options and genetic screening are significant, the best option currently available for reducing the impact and the mortality rate of breast cancer is screening mammography, particularly for target women (aged 50-69).

2.1 Detection and Prevention of Breast Cancer

The success of the available treatments is largely dependent upon how advanced the breast cancer is at the time of treatment commencement, and thus the promotion of early detection has become a priority. The cost of treatment of advanced-stage breast cancer is far greater, both in human and financial terms, than the cost of secondary prevention initiatives such as a population-based screening program (Roberts & Birch, 2001). Secondary prevention, a phrase often used synonymously with early detection, aims to manage existing conditions or symptoms so as to reduce the severity or duration of the health problem. This is distinct from primary prevention, the goal of which is to prevent the occurrence of health problems. As with most cancers, the causal factors for breast cancer are complex and not fully understood, and thus primary prevention is extremely difficult. Consequently, secondary prevention is the focus of breast cancer-

related public health efforts, which centre primarily on screening and detection behaviours.

The emergence of early detection as a research and communication priority reflects a paradigm shift away from concentrated efforts to improve treatment, and towards attempts to arrest the cancer before it reaches advanced stages (Dean, 2002). This is made possible only by early diagnosis, primarily as a result of screening mammography (Klemi et al., 2003; White, Griffith, Nenstiel, & Dyess, 1996), however two other methods, breast self-examination (BSE) and clinical breast examination (CBE), are also discussed in this section. Currently, these three main detection methods are endorsed to varying degrees by different breast cancer awareness organisations and government health bodies. An overview of each of these methods is given in the following sections, with a particular emphasis on the efficacy of each strategy for assisting in early detection.

2.1.1 Breast Self-Examination

Breast self-examination (BSE) is the process of examining one's own breasts for the purposes of being aware of their normal appearance and feel, so as to increase the likelihood that a change will be detected if it occurs. BSE involves visually examining and physically palpating the breasts, usually in a systematic, step-by-step fashion so that all the breast tissue is covered. If BSE is performed, it is usually recommended that it be done with some regularity (e.g., once a month, at the same time each month).

Whether or not to recommend regular BSE to women as a secondary prevention strategy has been the source of some controversy. Recent evidence suggests that not only is BSE ineffective at preventing breast cancer deaths, but that it may in fact cause harm. A systematic review conducted by Baxter et al. (2001) reported on eight studies (two randomised controlled trials, one quasi-randomised trial, and five cohort or case-controlled studies) that assessed the effectiveness of BSE, as measured primarily by a reduction in breast cancer mortality. Based on the results of these studies, Baxter et al. reported that for women aged 40-69, BSE resulted in unnecessary intervention (as reflected by an elevated frequency of benign breast biopsy), and increased physician visits. Further, performance of BSE did not improve women's chances of survival from breast cancer. Consequently, Baxter et al. concluded that women should not be routinely

instructed to perform BSE, however if they choose to do so they should be thoroughly educated as to the benefits and risks.

One of the randomised controlled trials reviewed, a longitudinal study conducted in Shanghai with 266,064 women over a ten year period, has since been completed since the publication of Baxter et al.'s (2001) review. The final results were consistent, showing that intensively instructing women to conduct BSE did not reduce the number of breast cancer deaths (135 breast cancer deaths in the instruction group, versus 131 deaths in the control group, Thomas et al., 2002). In response to this evidence, Harris and Kisinger (2002) argued that recommendations to physicians and to women should be amended to exclude promotion of BSE. Meanwhile, the American Cancer Society, Canadian Breast Cancer Foundation, the United Kingdom's Department of Health, and the Australian NBOCC continue to recommend breast examination to women as young as 18 years of age, but only as a means of becoming breast aware and familiar with the normal look and feel of their breasts. No specific method or frequency is recommended, and there is a distinct move away from systematically educating women on how and when to examine their own breasts. Each of these organisations emphasises that BSE is optional, and is not an essential preventive health behaviour (see Baxter et al., 2001; Smith et al., 2003).

2.1.2 Clinical Breast Examination

Clinical breast examination (CBE) is an examination carried out by a trained health care provider, such as a general practitioner or a woman's health nurse. The techniques used vary between clinicians, but the examination generally involves the inspection of the appearance of the breast, and systematically palpating the breast tissue from the collarbone, to the underarms, to the base of the breast.

There are no published randomised controlled trials comparing CBE with a no-screening control. The published research on CBE that has been conducted indicates that CBE makes just a small contribution to the detection of breast cancer (Bobo, Lee, & Thames, 2000), and offers no additional benefit than is offered by mammography in terms of prevention of breast cancer deaths (see Miller, Baines, & Wall, 2000). However, this does leave the possibility that CBE offers some preventive benefit for those women not undergoing regular mammography, whether because of age, restricted access to services, or personal choice.

The United States Preventive Services task force concluded that there is not enough evidence to make a recommendation for or against CBE (Humphrey, Helfand, Chan, & Woolf, 2002), and the Australian NBOCC's position statement echoes these sentiments (NBCC, 2004). In contrast, some organisations in the United States (e.g., American Cancer Society and the American Medical Association), as well as the Canadian Taskforce on Preventive Health Care do recommend women undergo CBE, though these organisations vary in their recommendations about frequency and age (see Morrison, 1994; Smith et al., 2003). Saslow et al. (2004) argue that given there is no evidence of harm from performing CBE, and that it is practised extensively, effort should be directed at improving and standardising the delivery of CBE so as to optimise this procedure.

2.1.3 Mammography

A mammogram is an x-ray of the breast tissue, designed to detect malignant abnormalities in the breast through imaging. Screening mammography is designed to be undergone regularly by asymptomatic women to screen the breast tissue for abnormalities by taking two x-rays of each breast. Screening mammography is distinguished from diagnostic mammography, which is a more extensive procedure performed to further evaluate a previously detected abnormality (e.g., a lump, nipple discharge, discomfort or pain in the breast, or a change in appearance of the breast). This project focuses exclusively on screening mammography because this secondary prevention procedure is available at a population level, while diagnostic mammography is only performed upon referral after an abnormality is detected. Henceforth, the terms 'mammogram' or 'mammography' refer exclusively to 'screening mammography'.

Although the incidence rate of breast cancer in developed nations such as the Australia and the United Kingdom is climbing, the mortality rate is declining (see Schopper & de Wolf, 2009). Both the increasing diagnoses and the declining mortality rate are partially attributable to early detection through regular mammographic screening of asymptomatic women (AIHW & NBOCC, 2009; Klemi et al., 2003). A number of noteworthy pieces of evidence support this claim. An early randomised controlled trial in Sweden (N = 162,1981) found that population-based screening both significantly decreased the breast cancer mortality rate, and significantly reduced the number of late-stage diagnoses (Tabar, Gad, Holmberg, & Ljungquist, 1985). More

recently, a meta-analysis of 13 studies (nine randomised controlled trials, four case controlled studies) that assessed the efficacy of mammography demonstrated that screening mammography reduced breast cancer mortality rates by 26 percent for women aged 50-74, but that there was no benefit for women aged 40-49 (Kerlikowske, Grady, Rubin, Sandrock, & Ernster, 1995). In another meta-analysis based on eight randomised controlled trials, Humphrey et al. (2002) concluded that screening mammography resulted in a significant decrease in breast cancer mortality rates for women aged 40-74, and it was noted that the benefits outweighed the costs more strongly for the older women. Further, they concluded that annual, as opposed to biennial, screening was more effective at reducing the mortality rate.

Thus, the evidence that regular screening mammography significantly reduces the breast cancer mortality rate is substantial. This evidence compliments earlier findings that early detection through mammography not only facilitates an increase in breast cancer survival rates, but also results in a higher quality of life for breast cancer survivors, as it reduces the need for radical surgery or long-term invasive treatment (Hall, Gerard, Salkeld, & Richardson, 1992).

In line with the evidence that mammography is the most effective means of early detection of breast cancer, many developed countries have adopted guidelines and programs to encourage and facilitate regular mammographic screening. Some points of difference across population-based screening programs include the age at which it is recommended women commence screening, and the frequency with which they are advised to attend for a mammogram. For example, the guidelines in the United States recommend mammographic screening every one to two years for all women aged 40 and above, although this guideline has recently been challenged by the United States Preventive Health Task force as being too regular and targeting women who are too young. In contrast, the United Kingdom's national screening program actively recruits women aged 50 - 70 for mammographic screening every three years. In Australia, the national screening program actively recruits women aged 50 - 69 for mammographic screening every two years. Despite these differences, it is critical to note that these programs are similar in goals and implementation.

It is worth noting that routine mammographic screening of asymptomatic women may lead to over detection and overtreatment, and some researchers argue that these risks are often ignored or disregarded by health professionals, patients, and

researchers (see Barratt, Howard, Irwig, Salkeld, & Houssami, 2005; Jorgensen, Klahn, & Gotzsche, 2007; Schwartz, Woloshin, Fowler, & Welch, 2004). However, given mammographic screening is the recommended early detection strategy for breast cancer in Australia, promotion of this service is still warranted. More detail about Australia's mammography screening program is provided in the next section.

2.2 Australia's National Screening Program: BreastScreen Australia

BreastScreen Australia is the national, population-based mammographic screening program that actively recruits target women for screening every two years. Screening mammography is offered free of charge at over 500 BreastScreen Australia sites across the country. Target women (those aged 50-69) are recruited to the screening centres via mail-outs, and an automated service prompts centres to mail reminder letters to women who are due for rescreening (AIHW, 2007). Women aged 40-49 and those aged 70 and over are also eligible to participate in the mammographic screening program, though they are not actively recruited. Women in the target age range receive the most benefit from biennial screening, in terms of prevention of death from the disease (AIHW, 2007). The rationale for determining this target age range is that younger women undergoing screening may have many false positives due to dense breast tissue and, further, younger women are more likely to suffer from an aggressive form of cancer that may not be detectable at an early stage even with regular screening (Brewer & Reiter, 2008; Brewer, Salz, & Lillie, 2007; Kerlikowske, et al., 1995). Older women are more likely to have other health priorities, and be less likely to benefit from treatment (e.g., radiation, mastectomy) that may only serve to reduce quality of life (Mandelblatt, 2007; Smith et al., 2003).

At a population level, there is significant evidence that Australia's national mammographic screening program is successfully achieving many goals consistent with secondary prevention. The BreastScreen Australia Monitoring Report 2003-2004 reports an average 2.1 percent per annum reduction in the breast cancer mortality rate. Further, this same report also documents that Australia's mammographic screening program has resulted in statistically significant increases in the detection of small diameter cancers in target women. In 2000-2002, 78.6 percent of all invasive cancers diagnosed in Australia were detected through the BreastScreen national screening program.

While the evidence for mammography is clear, many target women are not participating as recommended in the national screening program. This issue is discussed in more detail in the next section.

2.3 Predictors and Barriers to Mammography Screening

Numerous studies report that women express clear positive attitudes towards mammography, such as a belief in the efficacy of early detection of breast cancer and prevention of death (e.g., Irwig et al., 1991; Nekhlyudov, Ross-Dengan, & Fletcher, 2003). Indeed, nine in 10 Australian women report a belief that screening mammography is either very or quite effective (Department of Health & Aging, 2004). Further, women tend to perceive that breast cancer has a high incidence rate, and that they have at least a low to moderate risk of developing breast cancer in their lifetime (Paul, Barratt, Redman, Cockburn, & Lowe, 1999). Despite these findings, screening mammography remains under-utilised by target women. Despite active recruitment and reminders via mail-outs, as well as constant media campaigns, BreastScreen Australia reports a participation rate of only 57.1 percent. This participation rate is significantly lower than the target 70 percent, which is the aim of population based screening programs in Australia (BreastScreen Australia National Advisory Committee & Department of Health and Aged Care, 2000), and other developed nations such as the United States (National Cancer Institute, 1986) and the United Kingdom (Vessey, 1991). Note, however, that some women may be obtaining breast imaging (e.g., mammography or ultrasound) from a private provider. Indeed, a recent report suggests that up to 88.5 percent of target women in Australia reported having a mammogram within the last two years (Gregory & Jones, 2008). Although this statistic may be inflated due to socially desirable responding, when compared to the BreastScreen participation rate of 57.1 percent, it does suggest that up to 30 percent of target women may be obtaining breast screening from other, private services. Regardless, participation in the national screening program through BreastScreen remains the focus of most Australian mammography promotion interventions, including the current project. This is because BreastScreen Australia offers the only service that provides free mammograms at a population level, meaning any economic barriers to access are eliminated.

The fact that the screening rates are consistently falling below the target is a source of some concern, and has served to drive a number of mammography-related research directions. The first is the identification of barriers to screening. Fear and avoidance of discomfort, uneasiness, procrastination, radiation, and receipt of bad news, as well as a lack of awareness and misinformation have all been identified as barriers that prevent Australian (Department of Health and Aging, 2004), American (Lerman, Rimer, Trock, Balshem, & Engstrom, 1990; Partin & Slater, 2003; Rauscher, Hawley, & Earp, 2005; Rimer, Keintz, Kessler, Engstrom, & Rosan, 1989), Mexican (Tejeda, Thompson, Coronado, & Martin, 2009) Asian, and Asian-Indian (Wu, West, Chen, & Hergert, 2006) women from having regular mammograms.

The second research direction that has been shaped by the sub-optimal screening rates is the move towards the identification of predictors and facilitators of mammography. There is marked consistency in environmental and demographic factors that have been shown to increase the likelihood that a woman will adhere to mammographic screening recommendations. In both American and Australian samples, a higher socioeconomic status, higher levels of education, belonging to a majority ethnic group, being younger than 65, communicating with a general practitioner about mammography, and the presence of prior breast problems are predictors of mammography screening adherence (see Hurley, Huggins, Jolley, & Reading, 1994; Phillips, Kerlikowske, Baker, Chang, & Brown, 1998; Siahpash & Singh, 2002; Schueler, Chu, & Smith-Bindman, 2008; Swan, Breen, Coates, Rimer, & Lee, 2003; Calle, Flanders, Thun, & Martin, 1993). Further, a range of social cognitive variables such as beliefs about mammography, attitudes towards having a mammogram, social norms and social support have been identified as playing a role in predicting adherent mammography screening behaviour (see Yabroff & Mandelblatt, 1999 for review). The role of social cognition in health behaviour is discussed in more detail in Chapter 5.

As indicated above, another research avenue that has evolved out of the identification of the barriers and facilitators is designing and testing interventions aimed at increasing screening rates amongst target women. Many of these interventions attempt to facilitate screening amongst target women primarily by increasing knowledge and awareness through the mass media. More recently, some interventions have harnessed interpersonal influence and everyday communication to promote mammography to target women. The field of health communication is rife with debate

about the relative effectiveness of mass versus interpersonal communication, and the following chapter samples some of this debate, particularly in regard to preventive health interventions.

3 Preventive Health Communication

The previous chapter introduced breast cancer as a public health issue and presented screening mammography as the best preventive health strategy, as it facilitates early detection and therefore a lower breast cancer mortality rate. Screening mammography is then the priority breast health message that must be communicated to target women. This chapter reviews modes of health communication, and in particular compares health messages delivered through the mass media with those delivered through interpersonal means. Mammography promotion campaigns and interventions that have utilised mass media or interpersonal messages, or a combination of both, are given particular attention in this chapter.

3.1 Mass Media Preventive Health Messages

Preventive health mass media campaigns utilise media channels such as television, radio, or print messages (Bauman, Smith, Maibach, & Reger-Nash, 2006). Mass media campaigns are *top-down* in their communication approach, in that the information is depersonalised, the message is delivered without interaction or the opportunity for feedback, and is often delivered from a perceived position of authority or from an authority figure ‘down to the masses’. Although mass media has a long association with health promotion, Rogers and Storey (1987) suggest that while mass media campaigns can impact positively on knowledge, attitudes, and intentions, they are less effective in facilitating behavioural change. Indeed, scholars have noted that the role of mass media in producing health behaviour change is somewhat contentious (e.g., Curbow et al., 2004), on the basis that these interventions are extensively utilised and researched despite the difficulty in achieving even small to moderate behavioural effects (Noar, 2006). Reviews of interventions targeting an array of health behaviours reflect both the limitations and the potential effects of mass media campaigns.

In an early paper, Udry, Clark, Chase, and Levy (1972) evaluated a mass media campaign that aimed to increase contraceptive use for the purposes of birth control. Television, radio, and print advertisements were used to saturate the media market in four geographically and demographically diverse cities in the United States. Eleven control cities were identified, and they were not exposed to the media campaign. The six-month mass media campaign facilitated a significant increase in community

awareness about family planning in the intervention cities as compared to control cities. However, there was no increase in the purchase of prescription or non-prescription contraceptives in any of the intervention cities as compared to control cities. Further, there was no greater increase in attendance at family planning clinics in cities that had been exposed to the intervention than in the control cities. Thus, while the campaign had a significant effect on knowledge, no behaviour change was evident from the above-mentioned objective indices.

Marcus, Owen, Forsyth, Cavill, and Fridinger (1998) conducted a review of seven large-scale campaigns that aimed to increase physical activity levels. One utilised television advertisements and a telephone hotline, and six used multiple media channels such as print, television, radio, and community events. Each campaign specifically measured change in activity as an outcome variable. The authors of this review conclude that while there was a high rate of recall of the campaign messages (approximately 70 percent of people across studies accurately recalled the campaign message), and there was some evidence of a moderate increase in intention to engage in physical activity, there was minimal evidence of increases in physical activity as a result of the campaign. The dissociation between improvements in knowledge and awareness and actual behaviour change is again evident in the results of this study.

Finlay and Faulkner (2005) conducted a review of physical activity mass media campaign studies published since Marcus et al.'s (1998) review. Five out of the eight studies reviewed for behaviour change reported some evidence of increased physical activity as a result of the campaign. The authors attempt to explain this discrepancy by pointing out that four of the five studies that showed evidence of behaviour change failed to report an intention-to-treat analysis (an analysis of the effectiveness of an intervention that includes all participants, regardless of whether they successfully completed the intervention), which may bias the results in favour of the intervention. Further, behaviour change was often limited to subgroups of the sample, which limits the generalisability of the results. Nonetheless, this particular review provides some evidence that mass media campaigns can affect changes in physical activity. However, the authors recommend that more sophisticated analyses be undertaken because the existing data are not without problems.

Bertrand, O' Reilly, Denison, Anhang, and Sweat (2006) conducted a systematic review of 24 mass media intervention studies that aimed to impact HIV-related

knowledge, attitudes, and behaviour in the developing world, with mixed results. The authors indicated that the outcome variables measured in many of these studies did not change significantly post-intervention, and where a statistically significant change did take place, effect sizes were small to moderate. However, it was noted that approximately half of the mass media interventions reviewed facilitated changes in knowledge and a reduction of high-risk behaviours, suggesting some level of success.

Similarly, Snyder et al. (2004) conducted a meta-analytic review of mass media campaigns across health behaviours, and concluded that these interventions do produce small effects on behaviour change. In general, campaigns that included an enforcement message, and those that promoted the adoption of a new behaviour (as opposed to those that promoted cessation of a behaviour) were the most successful in facilitating behaviour change. It is noteworthy that the average effect size for mammography promotion mass media campaigns ($r = .04$) was the lowest of all the campaign topics, lower even than campaigns addressing the cessation of addictive behaviours such as smoking ($r = .05$). Given the focus of the current thesis on screening mammography, it is important to consider further the effectiveness of mass media campaigns in facilitating this, and other cancer screening behaviour.

A review of more than 200 cervical cancer interventions found that if mass media campaigns did produce behaviour change, it was short-lived (Marcus & Crane, 1998); and Trumbo (2004) found that a youth-oriented mass media campaign to promote testicular self-examination had small but significant effects on knowledge, awareness, communication about the issue, as well as intention to self-examine, but there was no significant effect on behaviour. These results are consistent with those already reported for other health behaviours (e.g., Marcus et al., 1998; Udry et al., 1972). Further, while not specifically addressing the issue of effectiveness of mass media campaigns, Vernon (1997) reported that a review of 18 colorectal cancer screening interventions (as part of a larger review on colorectal screening) indicated that impersonal campaigns and interventions, such as those delivered through the mass media alone, resulted in lower adherence rates than those which incorporated interpersonal communication and influence such as small-group or community-based interventions, and those that involved follow-up telephone calls.

In a similar vein, the evidence for mass mediated mammography promotion campaigns is also insubstantial. As noted earlier, Snyder's et al. (2004) meta-analysis

demonstrated that mass media campaigns are particularly ineffective in promoting the uptake of mammography. Various print media interventions aimed at promoting breast and cervical cancer screening have failed to increase the rate of screening amongst Vietnamese-American women (Jenkins et al., 1999), and older American women overdue for screening (McCaul & Wold, 2002). An Australian study that compared mass media, community, and family physician interventions to promote mammography found that post-intervention screening rates were significantly lower in the towns that only received the mass media intervention, as compared to towns that received an interpersonal intervention, or a combination of intervention types (Clover, Redman, Forbes, Sanson-Fisher, & Callaghan, 1996).

Note that some mass media mammography promotion strategies have succeeded in delivering intervention-related behaviour change effects. BreastScreen Australia's national television and print media promotions for free screening mammograms increased self-reported attendance by 3 percent (Department of Health, 2004), and while at a population level this accounts for many additional women undergoing mammography, the screening attendance rate still consistently falls well below the target 70 percent. Additional mammography promotion strategies should be explored that may act as supplements to existing mass media campaigns.

The evidence reviewed here demonstrates that the effects of mass media campaigns vary greatly, and that mass media interventions alone do not reliably produce behaviour change. Specifically with regard to mammography, it can be concluded that while the mass media campaigns are likely to have a positive and significant impact on knowledge, awareness and intentions, the effects on actual mammography screening behaviour are not sufficient to produce optimal screening rates.

On the basis of the available evidence about mass media health promotion interventions, it can be concluded that such campaigns are not effective as the sole cue to action, and should be used primarily to raise the levels of knowledge and awareness of a health issue, perhaps as the backdrop to another, more personalised intervention. In her brief review of cancer screening interventions, Rimer (1998) encourages researchers to consider the role of interpersonal influence in designing health promotion interventions. The following section will explore this notion further.

3.2 Interpersonal Influence as Health Communication

The interventions reviewed in Section 3.1 operated at either the population or community level. This top-down approach is generally understood to be less effective than interventions operating at a more proximal level to the target person (Westmaas, Gil-Rivas, & Silver, 2007), such as those that utilise social networks and interpersonal communication. The evidence suggests that interventions that combine mass media approaches with interpersonal interaction have been more effective in producing health behaviour change than mass media campaigns alone (e.g., Alcala, 1983; Hill, Rassaby, & Gray, 1982; Redman, Spencer, & Sanson-Fisher, 1990; Marcus et al. 1998). Specifically with regard to mammography, a review of 33 mammography promotion interventions found that social influence was a key feature of a successful intervention and was a strong predictor of effective behaviour change, second only to good theory and design (Stone et al., 2002). Many communication scholars have thus argued that while mass media preventive health campaigns are an effective initial strategy to raise awareness, knowledge, and levels of intention to engage in the desired behaviour, interpersonal message delivery should be emphasised as the mode of behaviour change (Southwell & Torres, 2006; Valente & Fosados, 2006; Rimal, 2003; Valente, Poppe, & Merritt, 1996; Williams, Abbott, & Taylor, 1997). So, given the evidence that mass media sources alone do not reliably or effectively produce behaviour change with regard to mammography and other preventive health behaviours, we must turn our attention to interventions that utilise interpersonal communication strategies.

The potential influence that interpersonal communication could exert on a person's decisions about preventive health behaviours is a relatively under-investigated area (Heaney & Israel, 2002), although researchers and health promoters are increasingly utilising interpersonal influence and communication as a means through which to promote preventive health behaviours with some success. Broadly speaking, this success has not been limited to increased knowledge and positive attitudes, but also includes increased performance of the targeted preventive health behaviour. Interpersonal communication interventions that are conducted through existing social networks have been effectively used to engender behaviour change with regards to a range of preventive health behaviours such as alcohol and substance abuse prevention (Malis & Roloff, 2007; Valente, Okamoto, Pumpuang, Okamoto, & Sussman, 2007), increasing fruit and vegetable intake (Buller et al., 2000; Devine, Farrell, & Hartman,

2005), and safe sex and AIDS/HIV prevention (Kelly et al., 1997; Miller et al., 2008; Valente & Fosados, 2006).

Interpersonal influence and communication may occur within *formal* relationships (e.g., between health care provider and patient), the power of which has been reported with regards to performance of preventive health behaviours such as cervical cancer screening (e.g., Ackerson, Pohl, & Low, 2008), exercise (e.g., Bull & Jamrozik, 1998), and mammography (e.g., Dalessandri, Cooper, & Rucker, 1998; Lauver, Owen, Egan, Lovejoy, & Henriques, 2003; Liang, Kasman, Wang, Yuan, & Mandelblatt, 2006; Tolma, Reininger, Ureda, 2006; Zapka, Stoddard, Costanza, & Greene, 1989).

Additionally, *informal* relationships (e.g., those between peers and family members) may facilitate everyday interpersonal communication about health, and indeed this is a common channel through which to garner health information (Baxter, Egbert, & Ho, 2008). However, Cline (2003) argues that in the field of health communication research, everyday interpersonal communication has been relatively neglected and consequently we have only glimpses of its potential role it could have in influencing health behaviour. Recent years have seen an increase in interest in the role of everyday interpersonal communication in health promotion, which is likely a response to the growing awareness of the limitations of mass media interventions. For example, it has been demonstrated that peer influences are effective in facilitating safe sex behaviour among men who have sex with men (Kelly, 2004), and Cline (2003) found that everyday interpersonal communication facilitated the adoption of HIV/AIDS preventive behaviours by impacting perceived social norms. Further, interpersonal communication about cancer prevention between hair and beauty salon staff and their clients served to increase preventive behaviours amongst the clients (Linnan et al., 2005; see also Linnan & Ferguson, 2007).

When it comes to mammography, it is interesting to note that while women perceive sources of personal influence (such as friends, husbands and physicians) as important when making a decision about mammography (Parchman & Burge, 2004; Schechter, Vanchieri, & Crofton, 1990), they also report that the majority of their information about screening comes from mass media sources (Nekhlyudov et al., 2003). As indicated earlier, mass media interventions do not consistently produce substantial behaviour change effects, however this appears to be the primary source that women

attend to. In an attempt to address this imbalance, a small tapestry of work has examined the influence of interpersonal communication with regard to mammography decision-making and behaviour. Allen, Sorensen, Stoddard, Peterson, and Colditz (1998) found that social influences (formal and informal) and the perception that screening was normal amongst peers were significantly associated with regular mammography screening among working American women of screening age. Likewise, Lauver, Henriques, Settersten, and Bumann (2003) found that high scores on measures of social influence from normative referents were associated with having had, or having strong intentions to have, a mammogram amongst screening-aged American women. In addition, Messina et al. (2004) found that informational and emotional forms of social support increased the likelihood of repeated mammography. Finally, breast health messages that were delivered interpersonally were more memorable than mass media messages for women of both screening and non-screening age (Smith et al., 2009); and women who engaged in dialogue about breast screening with friends and family were more likely to have undergone breast screening (Allen, Stoddard, & Sorrensen, 2008; Husaini et al., 1998; Jones, Denham, & Springston, 2006).

In addition to these correlational studies, a small number of community interventions have used interpersonal communication as a method of promoting mammography. *The Witness Project*TM is an existing breast cancer education program implemented in the United States that uses interpersonal communication through informal relationships, aiming to increase breast screening amongst African American women. Witness Role Models (African American breast cancer survivors) share their own narratives while Lay Health Advisors (trained community members) have a complementary role that involves the target women in breast self-examination, mammography, networking, organising activities and answering questions. Significant increases in mammography utilisation rates in numerous locations have been consistently found when the Witness Project was assessed (Erwin, Spatz, Stotts, Hollenberg, & Deloney, 1996).

Similarly, another mammography promotion program called *Friend to Friend* was implemented in public housing high-rise buildings in Minneapolis in the United States. The program consisted of education and discussion sessions led by health professionals and trained lay people about mammography, and all sessions were held within the public housing residential buildings. Women who attended these sessions

were then encouraged to discuss the sessions with non-attenders, and encourage them to arrange a mammogram by contacting program leaders. The results of the program suggested that this intervention that promoted interpersonal influence between residents was successful at facilitating mammography screening amongst women aged 50-79. More women whose buildings participated in the intervention attended for a mammogram during a 15-month time interval (64 percent), as compared to a control group (52 percent). While this behavioural effect was significant, no significant changes in knowledge, attitudes, and beliefs were evident (Slater et al., 1998).

Learn, Share and Live was another breast cancer education program that was implemented in multiple sites in St Louis in the United States. This intervention used health professionals to educate women already actively involved in lay leadership and community roles in their cities (see Skinner et al., 1998). These women participated in an education program that addressed mammography awareness, knowledge and beliefs, and specifically encouraged them to share what they had learned with their friends, and helped them develop skills to do so. Intervention outcomes reported by Skinner, Arfken, and Waterman (2000) show that both knowledge of mammography and perceived benefits of the procedure significantly increased amongst participants as a result of the program. Significant increases in the number of interpersonal discussions about mammography, and increases in mammography attendance occurred in one of the two sites, providing evidence that an interpersonal intervention can increase everyday on-topic communication, as well as increase the desired behaviour. The dual effectiveness of this intervention makes it particularly noteworthy. The second site demonstrated a significant increase in screening behaviour, but not discussions about mammography, possibly because the women at the replication site were already initiating such conversations at baseline.

If the programs outlined here have been successful in facilitating and utilising everyday communication among existing informal social networks, then it is reasoned that a similar approach could be used within another kind of informal relationship: that between female family members. The family network is an existing social structure that may be a fruitful context within which to encourage everyday interpersonal communication about mammography, and in turn promote mammography to target women. The following chapter will explore informal family communication as a vehicle for promoting mammography to target women.

4 Family Communication as a Vehicle for Mammography Promotion

Chapter 3 outlined a case for utilising interpersonal influence and everyday communication as a means of encouraging target women to have mammograms. This chapter examines the family as a specific context within which this may occur. In particular, upward family communication (communication from the younger generation up to members of an older generation) is identified as a possible means of influencing target women to attend for mammography.

4.1 Family Communication and Health

Family communication is a richly investigated area that has diversified substantially over the past few decades. Family structure, family rituals, abuse, attachment, social support, aging, and health are just some of the many topics that are currently being investigated within the context of the family (Rogers, 2006). One particular topic about which little is known is the way in which family members influence one another's health decision-making and behaviour through interpersonal communication (Swinehart, 1997). However, there is some emerging evidence that family members can be vehicles of influence when it comes to health behaviour. Particular insight into the health decision-making effects of family communication is provided through investigations of organ donation choices. Not only does family communication about organ donation positively influence attitudes towards donation (Conesa et al., 2004; Thompson, Robinson, & Kenny, 2004a) and lead to more positive perceived social norms (Morgan & Cannon, 2003), there is also evidence that family communication influences intention to donate and to provide consent, as well as actual implementation of these behaviours. For example, Siminoff, Gordon, Hewlett, and Arnold (2001) interviewed 420 families that had made organ donation decisions on behalf of a deceased relative. Analysis focussed on the factors that best predicted the provision of consent to harvest a deceased family member's organs. Family communication about organ donation emerged as one of the strongest predictors of the provision of consent. Similarly, family communication about organ donation has been shown to be a significant predictor of a patient's own intent to donate in American,

Japanese, and Korean samples (Bresnahan et al., 2007; see also Thompson, et al., 2004a).

There appear to be gender differences in the patterns of health-related family communication. Thompson, Robinson, and Kenny (2004b) found that women were far more likely than men to communicate with family members about organ donation. Further, when men did initiate family communication about organ donation, they often did so less effectively than women. Men often failed to talk about the important issues with their family members, such as their own personal opinions and wishes, and often their communication style was such that it did not foster a positive reaction from their conversation partner. Similarly, Dodd-McCue, Tartaglia, and Cowherd (2007) found that female family members were more communicative about organ donation decisions, and consequently tended to act as information providers and influencers to their relatives in this regard.

Evidence that women are better and more frequent communicators about health issues is not limited to the realm of organ donation decisions. Other research highlights that family communication about more private or sensitive health topics occurs primarily among female family members. Several studies that examined family communication about hereditary breast and ovarian cancer found a high degree of on-topic interpersonal communication among first degree family members, and that most women primarily discussed genetic information with close female relatives (Barsevick et al., 2008; Green, Richards, Murton, Statham, & Hallowell, 1997; Macdonald et al., 2007). Forrest et al. (2003) found that women were perceived by their relatives as gatekeepers of the family's genetic health information. A similar pattern is evident when examining family communication about sex. In DiIorio, Kelley, and Hockenberry-Eaton's (1999) study, mothers were identified as the most common conversation partner for topics of a sexual nature for both sons and daughters, and in a separate study, being female predicted having discussed sex with one's adolescent children (DuRant, Wolfson, LaFrance, Balkrishnan, & Altman, 2006).

The evidence suggests that when it comes to discussing topics relating to health decision-making and behaviour, everyday discussions within the family are an effective medium for information sharing and influencing attitudes and behaviour. The research reviewed above suggests that women are better and more frequent communicators about health topics. Female relatives choose one another as conversation partners for

discussions about health-related topics, particularly those of a private and sensitive nature such as organ donation decisions, hereditary cancer, and sex.

Thus, the family network of female relatives has potential as an effective health communication system. Encouraging women to engage in everyday communication with female family members about priority health issues, such as breast cancer and mammography, may make it possible to utilise existing communication tendencies within the family for a health benefit. Everyday family communication about health amongst female relatives may take a variety of forms depending on who initiates the conversation, and who the target of influence is. The following section explores these possible variants in detail.

4.2 Upward Family Communication

Traditionally, family communication research has investigated what may be termed *downward communication*, that is communication and its effects from the older generations down through the younger generations (e.g., Chaffee, et al., 1971; Grusec & Kuczynski, 1980). The ‘downward’ direction refers both to the initiator of the communication or dialogue, and the flow of influence. Indeed, much of the literature that targets the family as a vehicle for health communication focuses on downward communication, particularly with reference to parents’ influence on their adolescent children’s health behaviours such as drug use (Bertram, Barbir, Ball, & Carroll, 2003; Boone & Lefkowitz, 2007; Pennay et al., 2006), eating habits (Boone & Lefkowitz, 2007; Francis & Birch, 2005; Hanna & Bond, 2006), sexual activity and contraceptive use (Boone & Lefkowitz, 2007; Bynum, 2007; Dittus, Jackard, & Gordon, 1999; Hutchinson, Jemmott, Jemmott, Braverman, & Fong, 2003; Miller, Kotchick, Dorsey, Forehand, & Ham, 1998) as well as breast health (Silk et al., 2006). In recent years, several researchers (Kunkel, Hummert, & Dennis, 2006; Mosavel, 2009; Saphir & Chaffee, 2002) have identified a gap in the general family communication literature about ‘upward’ family communication: communication initiated by younger family members that influences the values, attitudes, beliefs, or behaviour of older family members.

The remainder of this chapter brings together theoretical concepts and empirical evidence that indicates that the upward flow of information and influence from the younger generation to the older generation is worthy of examination. The following

section provides a theoretical basis for the examination of upward family communication, as well as highlighting the available literature on the upward flow of health information and influence, specifically from the daughter to the mother.

4.2.1 Family Communication Patterns Theory

Family Communication Patterns (FCP) theory (Chaffee, McLeod, & Atkin, 1971; McLeod, Atkin, & Chaffee, 1972) is a social cognitive theory of family communication that developed out of media communication research. It describes the processes through which families come to have a shared social reality, and reach agreement in their perceptions of the social and material environment. FCP theory is unique because it emphasises bi-directional communication influences within the family (Koerner & Fitzpatrick, 2006), and hence provides a platform for investigating upward communication effects. FCP theory stipulates that family members will reach agreement by either conforming to other family members (*socio-orientation*) or by discussion and debate (*concept-orientation*), see Chaffee et al., (1971). Families will have different preferences for using these two strategies, and these strategies have behavioural implications for communication patterns within the family. McLeod et al., (1972) demonstrated that families did in fact differ behaviourally according to these two orientations.

To assist in the conceptualisation of these communication differences between families, more recent work has redefined and rebadged the two orientations as *conversation* orientation and the *conformity* orientation (e.g., Richie, 1991; Richie & Fitzpatrick, 1990). The conversation orientation refers to a belief that discussion of a wide range of topics is valuable, and that all family members' contributions are equally worthwhile. The conformity orientation refers to a belief that homogeneity of attitudes, values, and beliefs amongst family members is best. According to FCP theory, the degree to which each family is high or low on each of these dimensions, and the interaction of the dimensions, characterises communication patterns within the family. Placement on each orientation can be measured using the Revised Family Communication Patterns (RFCP) questionnaire, which is a valid and reliable measure of family communication attitudes and behaviour (Koerner & Fitzpatrick, 2002; Richie, 1991; Richie & Fitzpatrick, 1990). The details of this instrument are outlined in Chapter

6. Depending upon their placement on each orientation, families can be classified into four types, as depicted in Figure 4.1.

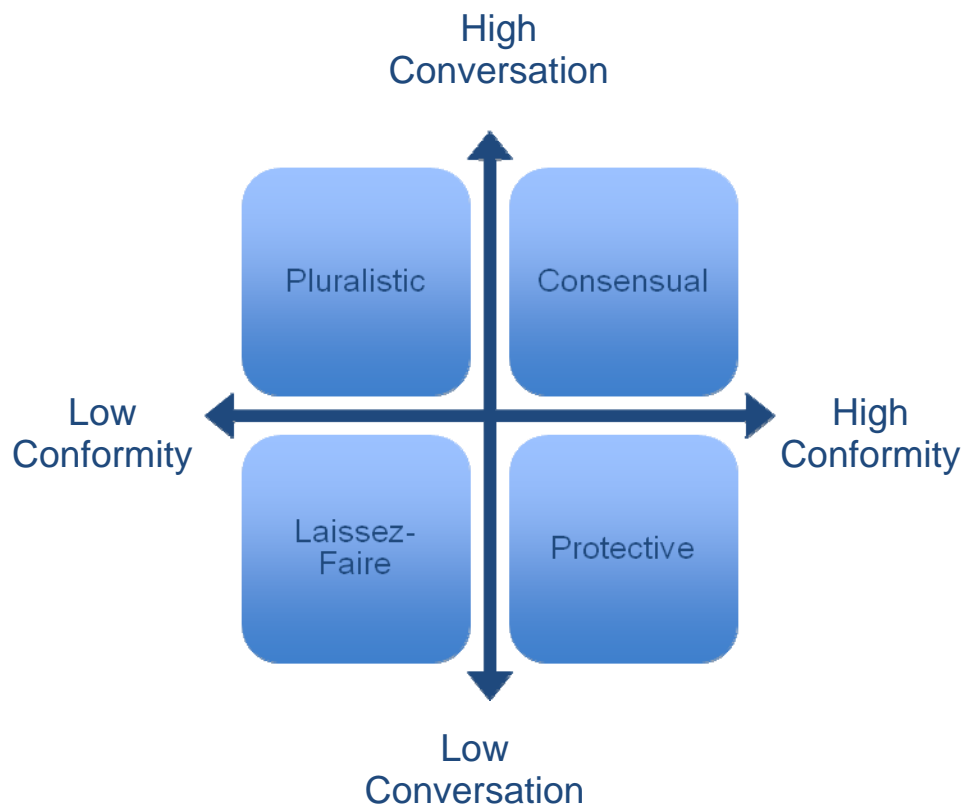


Figure 4.1. The four FCP family types based on positioning on the conversation and conformity orientations.

Previous published work (e.g., Richie, 1990; Koerner & Fitzpatrick, 1997a, 1997b, 2002, 2006) has included extensive descriptions of the nature of the communication patterns for each of the four family types based on the predictions of FCP theory, and these descriptions are summarised here. *Consensual* families are those that are high on both the conversation and conformity orientations. These families are characterised by valuing discussion of different ideas, and offspring are socialised to contribute to discussions and express their thoughts and ideas. However, these families also hold the belief that the older generation will lead and make the decisions of their own accord.

Protective families are those that are high on the conformity orientation but low on the conversation orientation, and as such, they emphasise the authority of the older

generation and value obedience to them. There is a distinctly downward flow of influence in protective families.

Families that are low on both the conversation and conformity orientations are classified as *laissez-faire*. Members of these families are often emotionally disconnected from one another, and discuss a limited number of topics. Meaningful interactions are infrequent, and members are highly autonomous, thus having little influence over one another.

Finally, families that are high on the conversation orientation but low on the conformity orientation are considered *pluralistic*. These families communicate without restraint, and all members' contributions are valued equally. They discuss a wide variety of topics openly, and do not avoid conflict. It is expected that the bidirectional flow of influence would be most apparent within this family type.

FCP theory has received substantial attention in the literature, and much of this research has focussed on measuring outcomes associated with the different family types. For example, Chaffee et al. (1971) found clear differences in the degree to which family members' media utilisation patterns are correlated depending on the family's type, while McLeod et al., (1972) found similar results in relation to violent media viewing and aggression. Also in the media communication field, Rose, Bush, and Kahle (1998) found that family type was associated with different parental responses to advertising. Koerner and Fitzpatrick demonstrated that a family's conversation and conformity orientations (as measured by the RFCP) are associated with their conflict and conflict resolution patterns (1997a), and also with the future romantic relationships of the offspring within the family (1997b). Further, Baxter and Clark (1996) found that the presence and enactment of family rituals is related to conversation and conformity orientations (again, as measured by the RFCP).

Despite the original scholars suggesting that family communication patterns are arrived at through bi-directional exchanges between the generations, most of the studies reviewed here emphasise unidirectional influence: from the parent to the offspring. Saphir and Chaffee (2002) advocate for a return to the original idea that parents and offspring influence one another, and that both upward and downward communication outcomes need to be measured. To this end, Saphir and Chaffee present data that indicate that upward family communication about politics was increased through exposure to a classroom-based intervention, and that upward family communication was

more frequent within concept (conversation) oriented families. Further, upward family communication about politics influenced both parents' and offspring's perceptions of the family's communication orientations six months later. The results of this study indicate that the conversation orientation in particular is associated with upward family communication, and that the behaviour of offspring can actually influence the way all family members perceive their family communication patterns.

In relation to the current project, the outcome of interest is the successful initiation of upward family communication about mammography. FCP theory thus provides a theoretical rationale for why we might expect offspring (some more than others) to influence their parents. Families at the high end of the conversation spectrum, that is families that encourage discussion on a wide range of topics, should be more likely to talk to and influence each other about sensitive topics such as health care. Thus pluralistic and consensual families may be more likely than other types of families to be receptive to an upward family communication intervention to promote mammography.

The influence of a family's positioning on the conformity orientation is more difficult to predict. On the one hand, if a family is at the low end of the conformity scale, it is unlikely that the offspring have been encouraged to develop their own views and opinions, and contribute these within the context of family relationships. On the other hand, there is some evidence to suggest that high-conformity family members are more likely to give advice to one another in an attempt to influence the behaviour of others (Koerner & Cvancara, 2002). It may be that a family's conformity orientation is less likely than the conversation orientation to influence receptivity to an upward family communication intervention about mammography. Regardless, it can reasonably be expected that in certain family types, namely pluralistic and consensual families, upward family communication is more likely to be both typical and influential.

However, before FCP theory can be used to predict and explain a specific outcome in a given population, the qualitative differences between the family types must be verified. To date, very little work has examined families for the general communication differences that FCP theory proposes between family type, and the major predictions regarding FCP were proposed more than three decades ago (McLeod et al., 1972). The current project addresses this issue in Study 1B (see Chapter 6) that measures family type as reported by both mother and adult daughter using the RFCP

instrument, and also qualitatively assesses self-reported interactions and communication patterns between mother and daughter.

While this section has addressed theoretical propositions as to why and how a daughter may be an influential communication partner with her mother, the following section addresses some pragmatic factors that enable the daughter to be well-positioned for initiating upward family communication about health. The next section also provides evidence that offspring, and daughters in particular, can influence their mothers' health decision-making and behaviour.

4.2.2 Upward Communication within the Mother-Daughter Pair

In addition to the FCP theoretical rationale for addressing upward communication between mother and adult daughter about mammography, there are some very practical reasons for pursuing this line of research. Firstly, non-kin relationships dwindle significantly as people age (Nussbaum, Baringer, & Kundrat, 2003), making family members the primary source of social influence. Further, one consequence of the aging population evident in many countries is that younger family members (e.g., adult daughters) will take on care-giving roles for their parents. It makes sense therefore to utilise the mother-daughter relationship to influence women of screening age (50 to 69 years) to engage in regular mammography. An early investigation into the mother-daughter relationship demonstrated that adult daughters generally reported positive and enduring relationships with their mother, in contrast to the stereotype that this relationship is riddled by conflict and hurt well into adulthood (Baruch & Barnett, 1983). This style of relationship provides a good context within which to encourage communication about health. In addition, on the basis of a large qualitative study with mothers and their daughters, Fingerman (1997, 2001) reported that the mother-daughter relationship is one of the most stable throughout the lifespan, giving further credence to the idea that the daughter may be a source of influence when it comes to preventive health behaviours.

Secondly, daughters are likely to be a source of support and assistance for their mothers as they age, increasing their position of influence, and this is perhaps especially true when it comes to matters of health (McGraw & Walker, 2004). Thirdly, as posited by Jones, Denham, and Springston et al, (2007), younger women (especially those attending university or college) may be more susceptible to preventive health

information, as the environment provided by tertiary education institutions creates a “teachable moment”. Women of this age are also less likely to have been exposed to faulty or mixed messages about mammography, and consequently may have less attitudinal or knowledge barriers and therefore be more teachable than their mothers. Even older daughters (aged 30 – 40 years) seem to be more susceptible to cancer screening messages, being more likely than women over 40 to undergo colorectal, skin, and breast cancer screening if they have a family history of one of these cancers (Shah et al., 2007). We may therefore rely on adult daughters’ influence through interpersonal communication to filter the message through to their mothers, who are likely to be in the target age range for mammographic screening. Finally and importantly, targeting younger women and prompting them to communicate with their mothers about preventive health behaviours enables the provision of information to two generations simultaneously (Mosavel, Simon, & Van Stade, 2006).

Other programs of research indicate that offspring demonstrate a general willingness to be involved in promoting healthful behaviours to their parents. Patten et al. (2004) conducted exploratory research to determine whether a public health campaign that involved American adolescent non-smokers as support persons was an effective intervention strategy. They found that adolescents aged 11 to 19 years reported a general willingness to help someone else stop smoking, and the target person most frequently nominated by the adolescent participants was a parent. Consistent with other research reviewed earlier, this study also found that female adolescents were more likely than male adolescents to be willing to assist someone to quit smoking. In a separate study, Patten et al. (2008) found that over 50 percent of young adults surveyed (aged 18-24 years, $N = 1621$) reported that they had previously attempted to assist someone give up smoking, with significantly more females indicating this was so than males. Again, many of these young adults indicated that a parent was the target of their concern. This apparent willingness of young adults to influence the health behaviour of a parent is encouraging, as it lends viability to the notion of upward family communication as a health promotion medium.

A small number of recent studies have begun to systematically explore the potential influence that daughters may have on their mother’s health decisions. Mosavel et al. (2006) conducted a descriptive study with a South African sample of 131 mothers and 145 adolescent daughters, and found that upward family communication about

health was a phenomenon that was present within mother-daughter relationships. Their results indicated that 70 percent of mothers ask their daughters for advice and, of these, 14 percent reported specifically asking their daughters for advice about health issues. An overwhelming majority of daughters (88 percent) perceived that their mothers respected what they had to say. Further, 63 percent of mothers agreed that daughters are more knowledgeable about certain things than they are, and more than a third of these mothers reported that their daughters were more knowledgeable about health-related topics. In further support of these results, Tejeda et al. (2009) concluded on the basis of interviews with Mexican women about facilitators and barriers associated with mammography that daughters should be involved in mammography promotion intervention activities.

Another study by Mosavel and Thomas (2009) aimed to gauge African-American and Latina daughters' willingness to advise their mothers on health issues. Seventy-eight adolescent daughters participated in focus groups that explored the nature of upward family communication exchanges. Daughters reported that they would often pass on information about things they learned at school to their mothers, as the daughter's access to learning opportunities gave them some credibility in the eyes of their mother. Many participants reported giving their mothers advice on a range of health issues such as smoking, weight loss, contraception, and even cancer screening. Furthermore, participants reported that their mothers often heeded their advice. Convergent evidence for the daughters' self-reports was provided in a related focus group study with mothers of the same demographic (Mosavel, 2009).

As part of a separate program of research, Washington, Burke, Joseph, Guerra, and Pasick (2009) conducted observations of interactions between Filipino and Mexican mothers and their adult daughters (over 30 years of age), as well as follow-up interviews with each woman separately. They reported evidence of mothers consulting their adult daughters for health advice, as well as evidence of daughters facilitating the health care of their mothers, even if they were not in need of assisted care. Mothers stated that they would follow their daughter's advice to take a medical test without hesitation, as they believed their daughters to be better educated and have more access to correct and relevant information.

Also of interest is a recent study in Turkey which trialled an intervention whereby daughters trained their mothers in BSE, thus utilising the principle of upward

transfer of breast health information. Gursoy et al. (2009) trained university aged women in BSE in a group setting, and instructed them to train their mothers. At one month post-intervention, mothers' knowledge about BSE had increased, while perceived barriers had decreased. Although this study used behavioural training rather than interpersonal communication, the conclusion is the same: daughters are influential sources of health messages for their mothers.

It is important to acknowledge that factors that contribute to closer and more positive relationships between mothers and their adult daughters are also likely to determine the frequency and quality of upward health communication within the dyad. Relationship satisfaction, intimacy, autonomy, attachment, and the extent to which mothers and daughters maintain a hierarchy in their relationship may influence a daughter's willingness to engage in upward family communication about mammography (see Fingerman, 1997, 2001; Kitamura, 2008; O'Connor, 1989; Rastogi & Wampler, 1999; Smith, Hill & Mullis, 1998). Further, these relationship factors may also influence how receptive mothers are to upward communication. However, an in-depth review of the nature of the mother-daughter relationship is beyond the scope of this thesis. Further, adult daughter participants (as in the studies by Gursoy et al., 2009; Washington et al., 2009, and the current program of research) are less likely to be living at home with their mother, and therefore, issues of access and regularity of communication may play a role in determining whether upward family communication takes place, *regardless* of mother-daughter relationship factors. Volitional and motivational techniques may assist in overcoming these barriers, an issue dealt with in more detail in Chapter 5.

4.3 Summary

Upward family communication about health between daughters and their mothers is both feasible and influential. It is clear that adolescent and adult daughters are willing and able to engage in conversations about health with their mothers, and that daughters have the potential to influence their mothers through advice-giving and everyday communication. The work reviewed here has highlighted the influence of the younger generation with regard to a number of health behaviours including smoking cessation, weight loss, different forms of cancer screening, and even topics of a very personal or private nature such as contraceptive use.

Thus, a primary aim of the current project was to develop and trial intervention techniques that take a novel path to mammography promotion. Instead of directing intervention efforts at the target women who often possess barriers and misconceptions that are difficult to overcome, the current project trialled interventions that are aimed at adult daughters of target women (aged approximately 18-39). Adult daughters were encouraged to initiate upward family communication about mammography with the goal of positively influencing their mothers' mammography beliefs and behaviour. The following chapters will outline the theoretical background and the development of the interventions that were piloted as part of this project.

5 Social Cognition and Behaviour Change

The previous chapter discussed the family as a vehicle and context for health communication. It discussed family communication as an effective vehicle for promoting health-related behaviours amongst family members, and highlighted that upward family communication is a relatively under-investigated area. Young women were identified as potential sources of information and influence for their mothers' health decision making. In particular, the notion of young adult women influencing their mothers to have (or consider having) a mammogram through everyday interpersonal communication was highlighted. This chapter conceptualises this daughter-initiated upward family communication about mammography as a health-related behaviour, and considers a selection of social cognition models that may predict performance of this target behaviour, and explain how to increase behavioural performance. Particular consideration is given to the Theory of Planned Behaviour as a framework within which interventions can be developed, and possible supplemental strategies to increase behavioural performance are identified.

5.1 Introduction to Social Cognition and Behaviour Change

Human behaviour affects health outcomes (Branch & Jette, 1984; Grzywacz, Corey, & Keyes, 2004; Wingrad, Berkman & Brand, 1982). Behaviour is central to the prevention of illness and disease, and the maintenance of health and wellness (Institute of Medicine, 2000). Therefore, we must consider how we can facilitate behaviours that are associated with positive health outcomes, and reduce or eliminate behaviours that are associated with negative health outcomes.

Leading behaviour change theorists agree on eight factors that contribute to determining whether or not a particular behaviour is enacted (Fishbein et al., 2001). These eight factors will increase the likelihood that a particular behaviour will be performed:

1. A strong positive *intention* to perform the behaviour (a commitment to enacting the behaviour);
2. the absence of *environmental barriers or constraints*;
3. possession of the requisite *skills* to perform the target behaviour;

4. a positive *attitude* towards performing the behaviour (positive evaluation of the behaviour);
5. positive *perceived norms* (important social referents are perceived to approve of the behaviour, and are perceived to be likely to perform the behaviour themselves);
6. consistency of the behaviour with *self-image* (the behaviour does not violate one's own standards or conflict with one's sense of self);
7. a positive *emotional response* to enacting the behaviour; and
8. high *self-efficacy* in regards to performing the target behaviour (the individual perceives they have the ability and capacity to perform the behaviour).

Of these eight factors, six of them can be identified as *social cognitive factors* (intention, attitude, perceived norms, self-image, emotional response, and self-efficacy), meaning these variables reflect cognitions or thoughts that influence one's interaction with the social world. Some of these social cognitive variables have a direct influence on behavioural performance (e.g., intention and perhaps self-efficacy, or the similar construct, perceived behavioural control) while others influence behaviour indirectly through increasing or decreasing intention to perform the behaviour (e.g., attitude, perceived norms). These factors form the basis of various theoretical models collectively referred to as social cognitive models (SCMs). These models attempt to predict behaviour, and explain and facilitate behaviour change, using social cognitive variables. There is evidence to suggest that interventions based on these models are more effective than other intervention approaches. A systematic review of interventions that aimed to increase safe sexual behaviour (e.g., condom use) found that only those interventions that were based on social cognitive models were effective in facilitating the desired behaviour change (Stephenson, Imrie, & Sutton, 2000). Similarly, a systematic review of physical activity interventions for older adults found that interventions that used a social cognitive model of behaviour change as a basis were more likely to report positive outcomes than atheoretical approaches (Conn, Minor, Burks, Rantz, & Pomeroy, 2003). Further, a review conducted by Jemmott and Jemmott (2000) found that the HIV risk-reduction interventions that had greater effects on social cognitive factors (e.g., knowledge, beliefs, and intention) also produced greater behaviour change effects (condom use).

Of particular relevance to the current project, several reviews have demonstrated the utility of SCM-based mammography interventions. A meta-analytic review of 63 mammography promotion interventions found that interventions based on a SCM framework increased screening rates in target women by 23.6 percent as compared to usual care (control group), which was more than other kinds of interventions that utilised approaches such as behavioural or generic educational strategies (Yabroff & Mandelblatt, 1999). Similarly, SCM-based interventions that attempted to prompt physicians to recommend mammograms were also particularly effective (Mandelblatt & Yabroff, 1999). That is, SCM-based interventions have been shown to be effective both for increasing screening directly, and for increasing communication about mammography screening. Note however that existing SCMs are not without flaws. For example, Ogden (2003) argues that while the theories offer some utility in predicting and explaining health behaviour, conceptual issues exist and the application and operationalisation of the constructs are often problematic. Nonetheless, the results of the reviews cited above highlight the relationship between social cognitive factors and behaviour, and demonstrate why SCMs have been, and should continue to be, the basis for health behaviour interventions.

Interventions that target social cognitive variables are effective because such factors are changeable and susceptible to influence. Other variables associated with health behaviour, such as demographics and personality, are fixed, stable, or beyond the reach of health promotion interventions. Although studying the relationships between these variables and health behaviour permits the identification of high-risk populations with regard to particular health outcomes, these factors are not good targets for health promotion interventions.

The following section outlines the basic tenets of a number of SCMs that have been widely applied to health promotion and health behaviour change. The Transtheoretical Model, the Health Action Process Approach, the Health Belief Model, Social Cognitive Theory, and the Theory of Planned Behaviour are each discussed in turn, along with a brief narrative review of evidence of the utility of each model, and comment on the model's applicability to the target behaviour of the current project – upward family communication about mammography (See Armitage & Conner, 2000; Conner & Norman, 2005; Renner & Schwarzer, 2003; Rutter & Quine, 2002 for more comprehensive descriptions and reviews of each of the models).

5.2 Models of Behaviour and Behaviour Change

5.2.1 Transtheoretical Model

The Transtheoretical Model (TTM) is a stage theory, and as such assumes that individuals move through discrete stages as they approach readiness to perform a behaviour, and each stage is characterised by different qualities (e.g., level of intention to perform the behaviour). Certain causal factors or cues serve to move an individual forward through the stages, with each stage being associated with different facilitating factors. The TTM is the leading stage theory applied to health behaviour (Sutton, 2005), and while the model was originally applied to smoking cessation (e.g., Prochaska, DiClemente, & Norcross, 1992; Prochaska, DiClemente, Velicer, & Rossi, 1993), it has since generated a large body of research across a wide variety of health behaviours.

The model specifies three pre-action stages of change: (1) precontemplation, (2) contemplation, (3) preparation, and two post action stages of change: (4) action, and (5) maintenance. Individuals are assumed to move linearly through the stages, although they may revert to a previous stage. Decisional balance (weighting of pros and cons), confidence in ability to perform the behaviour, and temptation away from performing the target behaviour, all influence whether or not an individual progresses through the stages towards long term behaviour change (the individual variables of confidence and temptation are sometimes replaced with self-efficacy). Experiential and behavioural processes (e.g., negative affect associated with failure to change behaviour, or introducing a reward for change) may also facilitate forward movement into a later stage. In studies of the TTM, progression into subsequent stages of readiness is the dependent variable, with the factors and processes outlined above being the independent variables.

In a meta-analysis of cross sectional studies that applied the TTM to exercise behaviour, Marshall and Biddle (2001) reported positive and significant effect sizes for identification of pros of exercising and self-efficacy to engage in exercise between each of the stages (with the exception of a non-significant effect size for pros between the contemplation and preparation stages), and negative, significant effect sizes for the identification of cons. These data provide some support for the TTM, however better support would be provided through longitudinal evaluations, or experimental evidence of the success of stage-matched interventions. Sutton's (2005) brief review of

longitudinal TTM studies reveals marked inconsistency in the results of the reviewed interventions, and concludes that they do not provide adequate support for the model. Herzog (2008) comments that out of six recent reviews of intervention studies based on the TTM (Ashworth, 1997; Bridle et al., 2005; Littell & Girvin, 2002; Riemsma et al., 2003; Spencer, Pagell, Hallion, & Adams, 2002; Van Sluijs, Van Poppel, & Van Mechelen, 2004) all of the authors except Spencer et al. concluded that the evidence for the model was poor. Herzog (2008) systematically reviewed both TTM intervention studies and prospective longitudinal studies and concluded that the evidence for the TTM was “disappointing” (p. 554). In particular, Herzog criticised the stages of change construct by providing evidence that the stages are not distinct or discreet categories. Other authors have also made similar arguments that have cast doubt on the theoretical validity and utility of the stages of change construct (e.g., West, 2005; Whitelaw, Baldwin, Bunton, & Flynn, 2000). Further criticism has been levelled at the TTM on account of its failure to operationalise social cognitive variables, and thus the model tells us very little about the role of such variables in the processes of change, nor does it address the question of why some people successfully change their behaviour while others do not (Armitage & Conner, 2000).

Given these concerns about the TTM, attention should be given to revising this stage theory to ensure it has utility and scientific grounding (Sutton, 2001), before applying it to novel health-related behaviours such as upward family communication about mammography. Another stage-based approach that has not attracted as much research attention as the TTM is the Health Action Process Approach, which is described in the next section.

5.2.2 Health Action Process Approach

The Health Action Process Approach (HAPA, Schwarzer, 1992) is a multi-stage theory of behaviour change that distinguishes between the *motivational* and *volitional* phases of change. The motivational phase refers primarily to the development of an intention to perform a particular behaviour. Schwarzer’s HAPA theory stipulates that the motivational phase constitutes consideration of pros and cons of a behaviour, determining the threat of the consequences of not performing the target behaviour, and the consequent formation of a behavioural intention, which is also influenced by self-efficacy and outcome expectations (Schwarzer, 1999).

The volitional phase refers to how this behavioural intention is converted into action, and consists of three stages: planning, action, and maintenance. Post-decisional and pre-actional cognitions constitute the planning stage, while self-efficacy is the strongest predictor of taking action (Schwarzer, 2001). Maintenance requires the activation of cognitions that protect the intention and the behaviour from interference or interruption, especially from competing intentions (Schwarzer, 1999). Disengagement from the goal can occur if appropriate self-regulatory strategies are not implemented (Schwarzer, 2001).

While many of the individual constructs of the HAPA have been empirically shown to be associated with behaviour change, such as self-efficacy (e.g., Bandura, 1997) and planning (e.g., Gollwitzer, 1993, 1999), few evaluative studies of the model as a whole have been published. In fact, the theory's original author has conducted the most comprehensive evaluation research to date. Longitudinal studies that employed structural equation modelling techniques found that the HAPA model was a good fit for behavioural performance data for BSE (Luszczynska & Schwarzer, 2003), as well as dental flossing, seat belt use, dietary behaviour, and physical activity (Schwarzer et al., 2007). While there is some evidence for the effectiveness of interventions tailored for individuals at different stages of behavioural adoption as defined by the HAPA model (e.g., Lippke, Ziegelmann, & Schwarzer, 2004), the interventions need not be conceptualised as 'stage-based' as they essentially target the presence or absence of an intention. Thus, this data does not necessarily provide support for the HAPA model alone.

The primary strength of the HAPA is the discernment between motivational and volitional stages of behaviour change on the basis of temporal processes of action initiation. However, the HAPA is subject to similar criticisms that have been levelled at the TTM, namely that the operationalisation of the volitional variables is vague (Armitage & Conner, 2000). Recently, Schwarzer (2008) distinguished between two version of the HAPA: one where the stages are explicit, and the other where stages are implicit (HAPA-C), although the constructs remain largely unchanged between the two. Sutton (2008) makes the claim that in spite of this development, the HAPA is not truly a stage model in the vein of the TTM, and is instead more similar to the Theory of Planned Behaviour (see Section 5.2.5). The similarities between the HAPA (particularly the motivational phase) and the Theory of Planned Behaviour have also been noted

previously (e.g., Abraham & Sheeran, 1997; Renner & Schwarzer, 2003) and comparative research of the two models has been suggested, though not systematically executed to date. This debate about the conceptualisation of the HAPA, along with the limited evaluation data suggest that the HAPA model is not yet sufficiently refined to inform complex behaviour change interventions. The HAPA is a model that promises substantial utility, but requires further formative research before application to a novel health-related behaviour is warranted.

5.2.3 Health Belief Model

The Health Belief Model (HBM) was originally coined to predict one-off health behaviours, such as being tested for an illness (Rosenstock, 1974). The HBM posits that health behaviour is influenced by the perception of threat (perceived susceptibility to illness, and perceived severity of the consequences of illness), evaluation of the behaviour (perceived benefits versus perceived barriers), general health motivation, and specific cues to action (e.g., exposure to a health education campaign, social pressure). Harrison, Mullen, and Green (1992) examined the average effect sizes of the HBM variables as applied to a range of health behaviours including testicular and breast self-examination, weight loss, and having a flu vaccination. Across 16 studies, the authors found that susceptibility, severity, benefits and barriers had small but statistically significant average effect sizes (.15, .08, .13 and .21 respectively).

Garcia and Mann (2003) reported that the HBM accounts for 43 percent of variance in dieting behaviour, but just 19 percent of the variance in breast self-examination behaviour. Further, a review of 16 mammography promotion studies that utilised the HBM concluded that this model has poor predictive power for screening behaviour (Yarbrough & Branden, 2001). While 13 out of 17 intervention studies reviewed by Abraham and Sheeran (2005) reported some evidence of behaviour change by targeting HBM belief constructs, these studies varied in the extent to which they applied the HBM to the intervention, and differed in the operationalisation of constructs, and in design. With regard to communication behaviour, limitations of this model include broadly defined constructs resulting in large variations in operationalisation and measurement, the omission of intention as a possible predictor of behaviour (intention has been shown to be an important contributor in explaining behavioural variance, e.g., Conner & Armitage, 1998; Sheeran & Orbell, 1998), and the

over-emphasis on rational, cognitive processes to the exclusion of social and affective influences.

The potential for the HBM to be used as a basis for an intervention promoting upward family communication is limited on two accounts. Firstly, the HBM is designed specifically to predict the personal health behaviour of an individual. So while it may be a useful framework to inform interventions that directly aim to increase mammography screening behaviour, the HBM constructs may not directly map onto the processes an individual would undergo when deciding whether to engage in upward family communication about mammography. In particular, how susceptible young women perceive themselves to be to breast cancer may not be as important as how susceptible they perceive their older female family member to be to breast cancer. Secondly, communication about mammography is not strictly a health behaviour in the sense that it may not be a behaviour that will impact on one's own health, and thus general health motivation is not necessarily a predictor of this behaviour. A model that does not limit its applicability to health behaviours is a better candidate for use as a basis for an intervention promoting upward family communication about mammography.

5.2.4 Social Cognitive Theory

Social Cognitive Theory (SCT) was first described as a full model of human functioning by Bandura (1986). SCT has two key constructs: self-efficacy and outcome expectancies. Self-efficacy is the belief that one has control over his/her own behaviour, and is competent to perform the target behaviour in the future. Self-efficacy is thought to influence not only behaviour, but also one's thoughts and feelings about the behaviour. Outcome expectancies are the expected physical, social, and self-evaluative consequences of behaviour. While both of these constructs are posited to influence behaviour directly, it is also thought that both self-efficacy and outcome expectancies influence behaviour via their impact on goal setting. SCT also makes note of possible social or environmental facilitators or barriers to goal setting, and therefore to behaviour. SCT was not originally designed for the explanation and prediction of health behaviour change. However, this theory has become a lynchpin for applied psychological fields, including health psychology (Luszczynska & Schwarzer, 2005). Self-efficacy in particular has been identified as a consistently strong predictor of a variety of health behaviours including contraceptive use (e.g., Wang, Wang, & Hsu,

2003), physical activity (e.g., Booth, Owen, Bauman, Clavisi, & Leslie, 2000), and nutritional eating (e.g., Conn, 1997). Further, in their review of nutrition-related interventions, Contento, Randell, and Basch (2002) concluded that changes in self-efficacy are particularly effective at producing changes in nutrition behaviour. In fact, the influence of self-efficacy on health behaviour is so widely accepted that many recent revisions of SCMs include self-efficacy (or the closely related construct of perceived behavioural control, however see also Ajzen, 2002) as a construct (Luszczynska & Schwarzer, 2005).

While the evidence for SCT is substantial, most of the predictive power of the model comes from the self-efficacy construct (Armitage & Conner, 2000), suggesting that it is this construct, rather than the full SCT model, that is key for health behaviour change. However, the fact that SCT is not restricted to the application of health behaviour is advantageous, as it may be able to predict and explain both communication *and* screening behaviours. Another SCM that holds this same advantage is the Theory of Planned Behaviour, which is examined in the next section.

5.2.5 Theory of Planned Behaviour

Although the Theory of Planned Behaviour (TPB; Ajzen, 1985, 1991; as an extension of the Theory of Reasoned Action [TRA], Ajzen & Fishbein, 1980), was not explicitly designed to predict and explain health behaviour, it has attracted much attention in the field of health psychology. The TPB posits that there are two proximal motivational predictors of behaviour. The first is *intention*, or readiness to perform a specified behaviour. The stronger one's intentions to perform a particular behaviour, the more likely the behaviour is to be performed (Ajzen & Madden, 1986). The intention construct should be understood as a specific behavioural intention when discussed and measured within the context of the TPB model, that is, a statement of intention to perform a particular behaviour (Ajzen, 1991). Behavioural intention is distinct from a goal intention that asserts only the desired end state and does not identify a specific behaviour that may contribute to goal realisation.

The second is *perceived behavioural control*, a construct closely related to self-efficacy. Perceived behavioural control is based on the perception of how easy or difficult it is to perform a behaviour, and incorporates factors such as skills, experience, confidence, and perceived barriers. While intention is construed as a consistent, strong,

independent predictor of behaviour, it is suggested that perceived behavioural control only independently predicts behaviour in circumstances where actual volitional control is reduced. Intention is determined by one's *attitude* toward performing the behaviour (overall evaluation of the behaviour), *subjective norms* (perception of the approval/disapproval of significant others), and perceived behavioural control. The TPB is diagrammatically represented in Figure 5.1.

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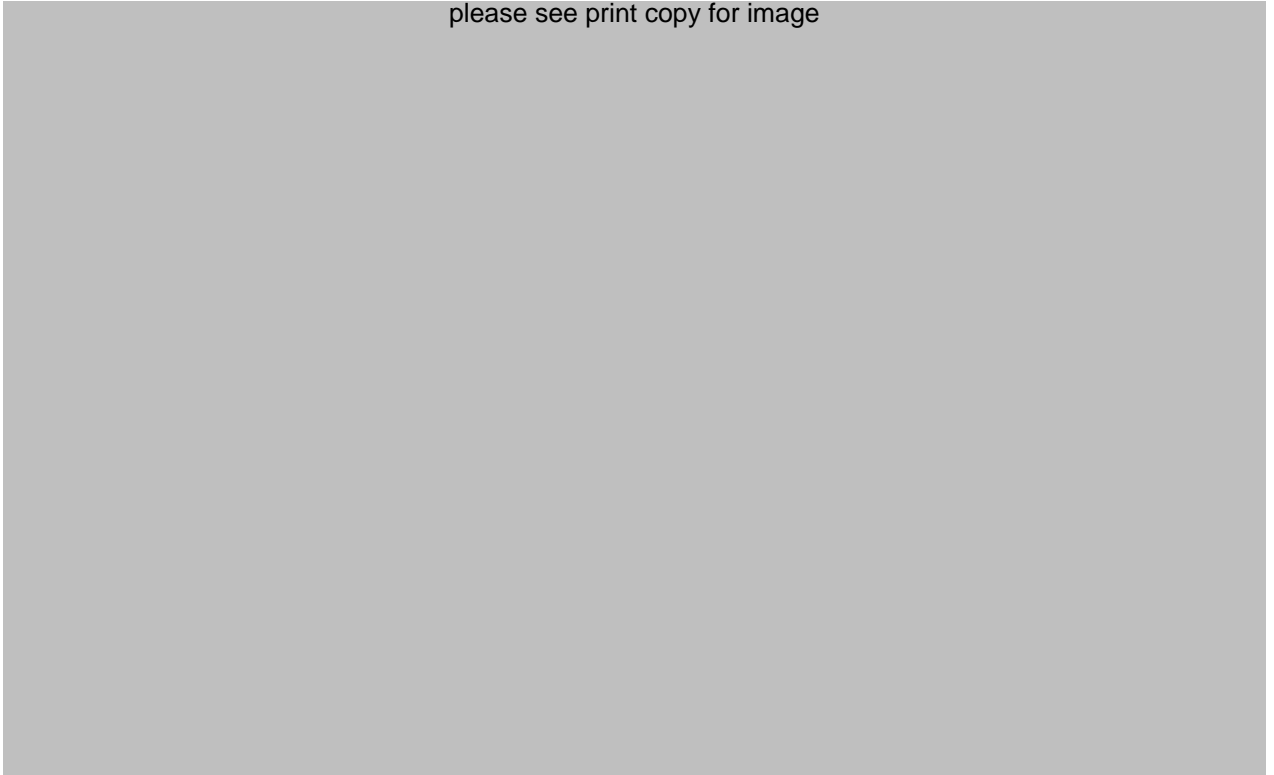
The diagrammatic representation of the Theory of Planned Behaviour model is not visible in this digital format. It is indicated that the image should be viewed on a print copy.

Figure 5.1. Diagrammatic representation of the Theory of Planned Behaviour model, adapted from Ajzen (1985, 1991).

The current project utilised the TPB model as a framework for predicting and facilitating upward family communication about mammography. The relationship between intention and behaviour was a particular focus of the research presented in this thesis. In contrast to other models reviewed in this chapter, the TPB makes explicit predictions about the relationship between intention and behaviour and provides a framework within which the nature and strength of this relationship can be explored. The next sections present evidence that the TPB is an effective model for predicting

health-related behaviour, and has potential for informing effective behaviour change interventions.

5.3 TPB as a Predictive Model

A number of meta-analytic reviews have been conducted to assess the TPB as applied to behaviour, and even health behaviour specifically (see Armitage & Conner, 2001; Ajzen, 1991; Cooke & French, 2008; Godin & Kok, 1996; Hardeman et al., 2002), with results demonstrating that the TPB model effectively predicts intention to perform a behaviour. In his review of TPB studies (not restricted to health behaviour), Ajzen (1991) found that attitudes, subjective norms, and perceived behavioural control account for up to 88 percent of the variance in intention, though most studies reviewed reported contributions of between 30 and 50 percent. In their more recent review of 185 TPB studies (on various types of behaviour), Armitage and Conner (2001) reported that the average proportion of variance in intention accounted for by other TPB variables was 39 percent, while Godin and Kok (1996) report a value of 41 percent in their review of health behaviour studies. Cooke and French (2008) conducted a meta-analytic review of 33 studies that applied the TRA/TPB to screening behaviours (e.g., mammography, colorectal, genetic), and found highly significant relationships amongst all TPB variables, with the strongest relationship being between attitude and intention. Together these reviews indicate that attitude, subjective norms and perceived behavioural control predict intention with considerable accuracy.

Although the TPB model predicts and explains intention with a great deal of success, the model fares less well when behavioural predictive power is examined. Evidence from meta-analytic reviews indicates that while intention is an important antecedent for behavioural performance, it is not always sufficient to predict behaviour. The percentage variance in behaviour accounted for by intention and perceived behavioural control is between 26 and 36 percent (Ajzen, 1991; Godin & Kok, 1996; Conner & Armitage, 2001), with the discrepancy likely to be attributed to the wide variety of behaviours that were included in the reviews. Cooke and French (2008) found highly significant relationships between intention and perceived behavioural control and screening behaviour. However, the intention-behaviour relationship was stronger. These findings demonstrate that, across a range of behaviours, good intentions are often not sufficient to result in behaviour change. The evidence suggests that while the TPB

model has utility in predicting behaviour, not all people who intend to perform a behaviour follow through on their intentions. This phenomenon has been labelled the “intention-behaviour gap”.

A final comment on the relative predictive power of intention and perceived behavioural control is necessary here. In most individual studies reviewed by Ajzen (1991), intention emerged as the strongest predictor of behaviour, and this pattern is also seen in the results of Cooke and French’s (2008) meta-analytic review. This is as expected. If a behaviour is perceived to be, and actually is, under complete volitional control, the perceived behavioural control variable will not add any predictive or explanatory power. Thus, in situations where the behaviour is both perceived to be, and actually is under complete volitional control, the intention-behaviour relationship will be at its strongest (Ajzen, 1991; Armitage & Conner, 2001). However, if the behaviour is not under complete volitional control (e.g., if successful performance of the behaviour also relies on the actions of other people), perceived behavioural control will independently predict behaviour, and may even make a greater contribution to the prediction of behaviour than intention under these circumstances.

5.4 TPB-Based Behaviour Change Interventions

The effectiveness of interventions designed to target TPB variables and consequently facilitate behavioural performance is less clear. Indeed, much intention-behaviour research has been correlational, with fewer published experimental or quasi-experimental studies examining the effects of interventions designed to strengthen intention. This over-reliance on correlational data has also been noted by other TPB researchers (e.g., Hardeman et al., 2002; Webb & Sheeran, 2006), and the need for further intervention research (Sutton, 2004) and for critical evaluation of the intervention studies that have been published (see Michie & Abraham, 2004) has been highlighted. Hardeman et al. (2002) conducted a systematic review of 24 TPB-based interventions and reported conservative conclusions regarding the effectiveness of such interventions in facilitating health-related behaviour change (e.g., condom use, fruit and vegetable intake, exercise, testicular and breast self-examination). Their systematic review revealed that while two thirds of studies appeared to be effective in facilitating the desired behaviour change, effect sizes were available for only 38 percent of these studies, and thus results should be interpreted with caution. Webb and Sheeran (2006)

conducted a meta-analysis of 47 interventions (not necessarily based on the TPB model) that targeted intention with the aim of facilitating behaviour change, and concluded that such interventions are more limited than correlational studies might suggest. They found that a substantial increase in intention was required in order to produce a small-to-medium sized effect on behaviour.

To obtain a deeper understanding of the effectiveness of TPB-based motivational interventions, an examination of some individual studies is necessary. Note that many of the TPB-based studies included in the systematic and meta-analytic reviews cited above did not employ theoretically consistent motivational interventions (that is, those that target social cognitive variables identified by the TPB model) to raise intention. Instead, many employed behavioural strategies (e.g., reward programs) that are inconsistent with the social-cognitive theoretical framework within which many of the studies claim to be operating. Of the studies that did use genuine motivational interventions, most were ineffective both in terms of strengthening intention, and in producing the desired behaviour change. For example, Beale and Manstead (1991) report no increases in intention to reduce children's sugar intake following an educational session conducted by a dental health educator with parents. Parker, Stradling, and Manstead (1996) used informational videos designed to target TPB-related cognitions about speeding, and also found that the intervention was unsuccessful in strengthening intentions not to speed. More recently, Sheeran and Silverman (2003) reported that a motivational intervention consisting of the provision of written information that targeted TPB variables had no effect on cognitions associated with attendance at a workplace fire safety course, and no effect on actual attendance. While most TPB-based interventions of this kind have been unsuccessful at facilitating behaviour, there is some inconsistency in the available evidence. For example, Brubaker and Flower (1990) used a taped persuasive message that targeted outcome beliefs about testicular self-examination, and this was successful in raising intentions and facilitating behavioural change. For the most part however, motivational interventions that target one or more of the TPB variables through the provision of information have not produced the desired behaviour change.

5.5 Rationale for Applying the TPB to Upward Family Communication About Mammography

The TPB is notable on two accounts. Firstly, like SCT, the TPB is not exclusively for use with health behaviours, though it has been successfully applied within the domain of health behaviour change. But secondly, unlike SCT (as well as the TTM, HAPA, and HBM), the reviews provide support for the TPB model as a whole, and not just selective components of the model, making it a good candidate to inform behaviour change interventions.

Upward family communication about mammography is not strictly a health behaviour, in that the behaviour has no immediate health benefit to self. We can however define it as a health-related behaviour, and other studies have applied the TPB to health-related behaviours with encouraging results. Casper (2007) found that a TPB-based intervention designed to increase intention to use, and actual use of, a mental-health screening tool by mental health professionals was more successful than a control (atheoretical) intervention. In addition, the TPB has effectively predicted intention to become a live organ donor (Browne & Desmond, 2008), intention to give signed consent for nonliving organ donation (Godin, Belanger-Gravel, Gagne, & Blondeau, 2008), and intention to donate blood (Reid and Wood, 2008). Note that each of these behaviours is altruistic and presents no direct benefit to the actor.

Further, there is some evidence that the TPB has utility in predicting health communication behaviour. Hyde and White (2009) demonstrated that all TPB variables were significantly and positively correlated with each other when measured in relation to family communication about organ donation. In addition, they demonstrated that a combined model of attitude, subjective norm and perceived behavioural control successfully predicted intention to engage in the target communication behaviour. Similarly, Barsevick et al. (2008) measured TPB variables in an attempt to understand women's intentions to communicate the results of a BRCA1/BRCA2 genetic test to family members, and found that global attitudes, specific social norms and perceived behavioural control were all significant predictors of intention.

The studies reviewed here provide evidence that the TPB can successfully predict intention to perform health-related behaviours, and also provide some indication that the model has utility in predicting and explaining health communication behaviour.

Thus, the TPB is a good candidate as a theoretical basis for predicting and facilitating upward family communication about mammography.

Note that the studies reviewed here do not address actual behavioural performance. Thus, the current program of research extends the findings of this previous work by not only applying the TPB to a novel health communication behaviour (upward family communication about mammography), but also by evaluating the behavioural outcomes of two interventions informed by the TPB. The following sections propose two strategies, one volitional and one motivational, that may be effective supplements to the TPB in order to best facilitate upward family communication about mammography.

5.6 Using Implementation Intentions to Bridge the Intention-Behaviour Gap

The lack of evidence to support the use of motivational interventions may reflect the need to turn research attention away from motivational variables and towards action implementation strategies (Johnston, Johnston, Pollard, Kinmonth, & Mant, 2004; Sniehotta, Scholz, & Schwarzer, 2005). That the TPB model (like most other SCMs) neglects the volitional phase of behavioural performance (where the intention is translated into behaviour) is indeed a common criticism (e.g., Conner & Norman, 2005; Renner & Schwarzer, 2003), and a substantial body of research has emerged that focuses on behaviour change interventions that use action implementation strategies to supplement the motivational TPB model. These strategies aim to address the well-documented intention-behaviour gap (e.g., Conner & Armitage, 1998; Sheeran & Orbell, 1998).

This shift in research attention has been largely facilitated by Gollwitzer's (1993) work with *implementation intentions*. Gollwitzer defined implementation intentions as plans that specify how, where and when a goal-directed behaviour will be implemented. Consider a woman who decided, "I want to start keeping up to date with my mammography screens". This is a statement of a goal-directed behaviour, or behavioural intention. However, the woman will be more likely to achieve this if she forms a plan for how the goal-directed behaviour will be implemented, that is, if she forms an implementation intention (II), for example, "Next time a reminder letter from BreastScreen arrives in the mail I will take the letter to work with me and call to make

an appointment in my lunch break”. In doing this, the woman specifies cues (such as ‘when’ and ‘where’) that then become increasingly cognitively accessible (Gollwitzer, 1999). Consequently, these environmental or situational cues are more likely to be attended to when they appear, and should trigger the stated behaviour in a manner much like habit, without conscious thought (Brandstatter, Lengfelder, & Gollwitzer, 2001).

Thus, forming IIs should increase the rate of conversion of behavioural intentions into actual behavioural performance, as a specified context and course of action is decided upon, and the contextual cues will elicit the goal directed behaviour. Gollwitzer and his colleagues have provided extensive support for this general proposition (e.g., Gollwitzer, 1993; Gollwitzer, 1999; Brandstatter et al., 2001), and the potential for IIs to be employed to facilitate behaviour change in applied contexts has been recognised (see Gollwitzer & Sheeran, 2006 for meta-analytic review, and Gallo & Gollwitzer, 2007 for a summary).

Of particular interest to the current project, IIs have attracted much research attention within the field of health psychology, and have been successfully used to increase behavioural performance of a range of health (and health-related) behaviours (see Adriaanse, de Ridder, & de Wit, 2009; Arbour & Ginis, 2009; Armitage, 2004, 2007, 2007b, 2009; Casper, 2008; de Nooijer, de Vet, Brug, & de Vries, 2006; Milne, Orbell, & Sheeran, 2002; Sheeran & Orbell, 2000; Prestwich et al., 2005; Rutter, Steadman, & Quine, 2006; Steadman & Quine, 2004). In particular, IIs have been employed as a supplement to the TPB model in an attempt to bridge the intention-behaviour gap by increasing translation of intention to behaviour. Figure 5.2 illustrates the chronology of the process, with IIs operating post-intentionally.

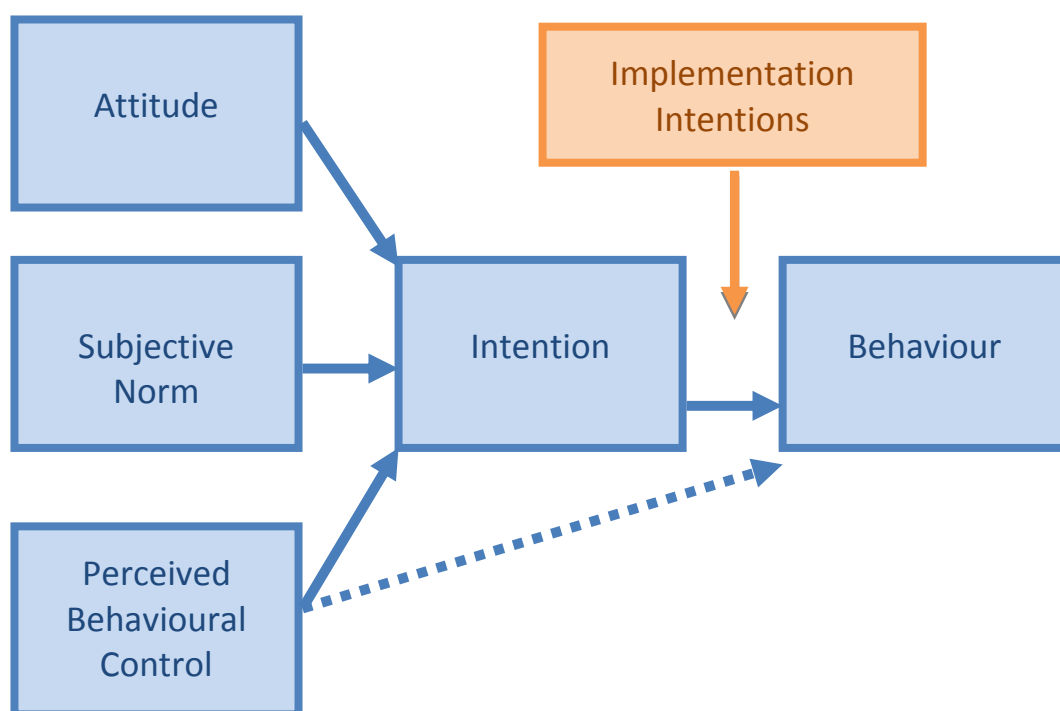


Figure 5.2. IIs supplement the TPB model by operating post-intentionally.

Using IIs to supplement the TPB allows researchers both to accurately predict an individual's intention to engage in the target behaviour by measuring the TPB variables of attitude, subjective norm, and perceived behavioural control (motivational phase), and to facilitate the conversion of intention into behaviour by prompting individuals to form IIs about how, where and when they will enact the behaviour (volitional phase). II interventions have been successfully used as a volitional supplement to the TPB in relation to exercise behaviour (Brickell, Chatzisarantis, & Pretty, 2006; Rise, Thompson, & Verplanken, 2003), smoking behaviour (Higgins & Conner, 2003), cervical cancer screening (Sheeran & Orbell, 2000), breast self-examination (Orbell, Hodgkins, & Sheeran, 1997), and attendance at workplace safety seminars (Sheeran & Silverman, 2003), and there is recent evidence to suggest that IIs mediate the relationship between intention and behaviour with regard to physical activity and dental hygiene behaviours (Wiedemann, Schuz, Sniehotta, Scholz, & Schwarzer, 2009), and that IIs moderate and mediate the intention-behaviour relationship with regard to use of sunscreen (Van Osch et al., 2008). In each of these cited studies, participants who formed IIs that either identified situational cues that specified when, where, and how a

behaviour would be enacted (e.g., “I will perform breast self-examination lying down in bed before I go to sleep”), or by making if-then plans (e.g., “If the weather is clear when I finish work, then I will go for a run”) were significantly more likely to perform the behaviour than control participants who did not form IIs. In light of this extensive evidence, the current project designed and piloted an implementation intention intervention that operated within a TPB framework targeting upward family communication about mammography. This project represents a novel application of IIs to everyday health communication behaviour. The intervention required young women to form IIs by specifying when, where and how they would initiate upward family communication about mammography, and it was expected that this may be a way of prompting them to enact this novel behaviour. Chapter 7 reports on this study in detail.

5.7 Using Counterfactual Thinking as an Active Motivational Strategy

While IIs are clearly a promising strategy for facilitating behavioural performance, the absence of volitional mechanisms in the TPB model may not be the only reason why TPB-based motivational interventions have largely failed in the past. One limitation of the motivational intervention studies reviewed in Section 5.4 is the passive manner in which the interventions targeted the motivational variables identified in the TPB model. It may be that most of these motivational interventions failed because they relied on the provision of information alone. Regardless of the information delivery media (e.g., expert, video, print), most TPB-based motivational interventions were not successful at increasing motivation or at facilitating behaviour change, and this may be because there was no way to ensure participants were attending to, or engaging with, the material. In contrast, Hillhouse and Turrisi (2002) employed a TPB-based motivational workbook about indoor tanning harm minimisation. The workbook intervention, which required input from participants, was successful in producing positive changes in indoor tanning attitudes, beliefs, intentions, and behaviours. Similarly, Prestwich, Lawton, and Conner (2003) employed an active motivational strategy that required participants to complete a decisional balance sheet which resulted in significant increases in exercise behaviour. Further, a paper-and-pencil booklet of motivational tasks about wearing a helmet when cycling resulted in significant changes in all TPB variables, as well as significant behavioural changes (Quine, Rutter, & Arnold, 2004). Finally, an interactive multi-media intervention program was successful in producing significant changes in

self-efficacy, attitudes, intentions, and behaviours related to healthy eating (Irvine, Ary, Grove, & Gilfillan-Morton, 2004). What these studies have in common is an active motivational task, which the studies reviewed in Section 5.4 lacked. The nature of the tasks employed in the studies reviewed in this section required active participation, and thus ensured participants were engaged in and attending to the motivational interventions. TPB-based motivational interventions may be optimally effective if they engage the participant in an interactive manner.

Thus, in addition to a promising volitional intervention, the research program presented in this thesis also included an active motivational intervention aimed at increasing behavioural intention. The current study utilised counterfactual thinking as a novel meta-cognitive strategy that ensured active participation (by requiring completion of a paper-and-pen task, as with Hillhouse & Turrise, 2002; Prestwich et al., 2003), and aimed to facilitate behavioural performance by increasing intention to engage in the target behaviour.

Counterfactual thinking (CFT) is the process by which people evaluate outcomes or consequences of their action (or inaction) by imagining better or worse alternatives to reality. The phenomenon of CFT has been extensively researched in social psychology, and has been applied in the context of problem solving, practical decision-making, and judgment. Research that has conceptualised CFT as a functional process has led to the idea that CFT may operate motivationally by increasing intention to perform a behaviour, and therefore facilitating behavioural performance (Epstude & Roese, 2008; Page & Colby, 2003). It is this idea that has led to the consideration of CFT as a strategy that may assist in facilitating upward family communication about mammography.

Counterfactual thoughts tend to take the form of causal statements that modify the antecedents of an outcome, leading to a result that differs from reality. A common manner of categorising counterfactual thoughts is by differentiating between thoughts about a better possible outcome (e.g., “If only I had set my alarm, then I would have arrived at work on time.”), known as *upward* counterfactual thoughts, and thoughts about a worse possible outcome (e.g., “At least I wasn’t so late that I missed the meeting.”), known as *downward* counterfactual thoughts. CFT is a pervasive and functional feature of adult cognition, and has been the focus of extensive research by

cognitive and social psychologists, as has already been mentioned (see Byrne, 2002; Roese, 1997 for reviews).

There is marked regularity amongst adults in their CFT patterns (Landman & Manis, 1992). There is a consistency in both the determinants of CFT, and the content of the counterfactual thoughts. A negative outcome (Kahneman & Tversky, 1982; Roese & Olson, 1995), negative affect in response to the outcome (Davis et al., 1995; Roese & Hur, 1997; Sanna & Turley, 1996), and proximity to the outcome (Kahneman & Tversky, 1982; Roese & Olson, 1995) are all factors that facilitate CFT. Note that upward counterfactuals are spontaneously generated far more frequently than downward counterfactuals (Roese, 1994), and again this is particularly true in response to negative outcomes (Markman, Gavanski, Sherman and McMullen, 1993; Roese & Olson, 1995; Sanna, 1998; Sanna & Turley-Ames, 2000).

As well as consistency in the determinants of the number and direction of counterfactual thoughts, there is demonstrated uniformity of counterfactual thought content, particularly with regard to which antecedents people choose to mutate when imagining alternative possible outcomes. When considering how a situation may have turned out differently, people will often mentally mutate antecedents that are perceived to be controllable by the individual (Giroto, Legrenzi, & Rizzo, 1991; McEleney & Byrne, 2006; Markman et al. 1993). Consequently, self-focused upward counterfactuals (i.e. those that mutate one's own behaviour) are more common than outward focused counterfactuals, such as those that might consider the role of other people's behaviour (White & Roese, 2007). In addition, following the passage of time, additive counterfactuals (those that add an antecedent) are more common than subtractive counterfactuals (those that subtract an antecedent; Byrne & McEleney, 2000; Kahneman & Miller, 1986), and are also more impactful (Dunning & Parpal, 1989).

Many of these patterns of regularity point to the functional benefit of counterfactual thoughts. Epstude and Roese (2008) highlight in their review paper that the most common counterfactuals (upward, self-focused, additive) are in fact those that offer the most functional benefit. As such, if a study is prompting or eliciting counterfactuals it should be ensured that the intervention conditions make it likely that upward, self-focused, and additive counterfactuals will be produced so that the thoughts best represent those that would occur spontaneously in real-world scenarios. This is

particularly important if CFT is being prompted for the purposes of eliciting the preparative functional benefit, as is the case for the current project.

The suggested functional benefits of upward counterfactuals assume that counterfactuals contribute to behavioural regulation. Epstude and Roese's (2008) review of the functional theory of CFT explicitly addresses the different mechanisms by which CFT (particularly in the upward direction) may influence behaviour. Specifically, they define and propose two different pathways through which CFT may play a role in behaviour regulation. The first pathway proposed by Epstude and Roese is the *content-neutral pathway*, and is depicted in Figure 5.3. CFT may activate cognitive processes such as attention and mind-set changes regardless of the actual content of the counterfactual thoughts, or the context in which the counterfactual thoughts are triggered.

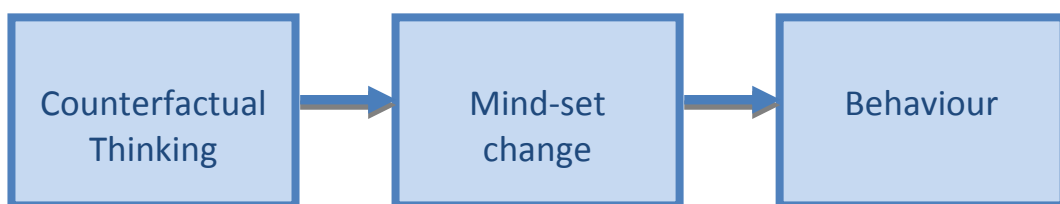


Figure 5.3. The content-neutral pathway through which counterfactual thinking impacts behaviour.

There is substantial evidence that the activation of a counterfactual mindset enhances task performance and problem solving, (e.g., Galinsky & Kray, 2004; Kray, Galinsky, & Wong, 2006), and that the negative affect that can result from CFT may act as a motivator (e.g., Markman, McMullen, & Elizaga, 2008). While the content-neutral pathway presents an interesting avenue for research, it is outside the scope of the current project.

The second pathway through which counterfactuals may influence behaviour is through the *content-specific pathway*, and it is this process that is investigated in the current project. The content-specific pathway involves identifying an action (or inaction) that is causally linked to the undesired outcome, mentally mutating that (in)action and imagining this change leading to a better alternative outcome, and then forming an intention to (not) perform the identified (in)action in the future. This

pathway is content-specific because the semantic content of the counterfactual directly informs a behavioural intention, as depicted in Figure 5.4.

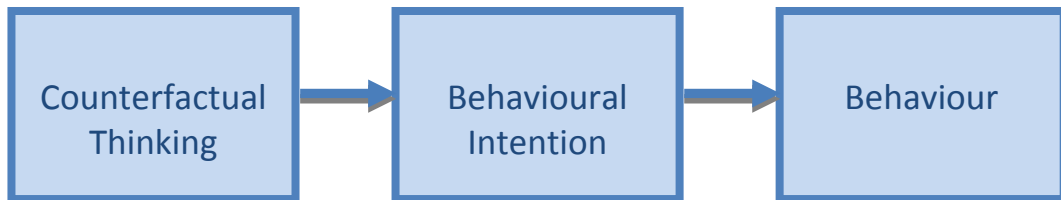


Figure 5.4. The content-specific pathway through which counterfactual thinking impacts behaviour.

Recall that Section 5.3 presented evidence that behaviour is best predicted by intention to perform that behaviour. The influence of counterfactual thoughts on behaviour via the content-specific pathway is posited to strengthen intention to perform a specific behaviour, which should in turn increase the likelihood that the behaviour is performed (Epstude & Roese, 2008). The chronology of the process within the context of the TPB model is illustrated in Figure 5.5.

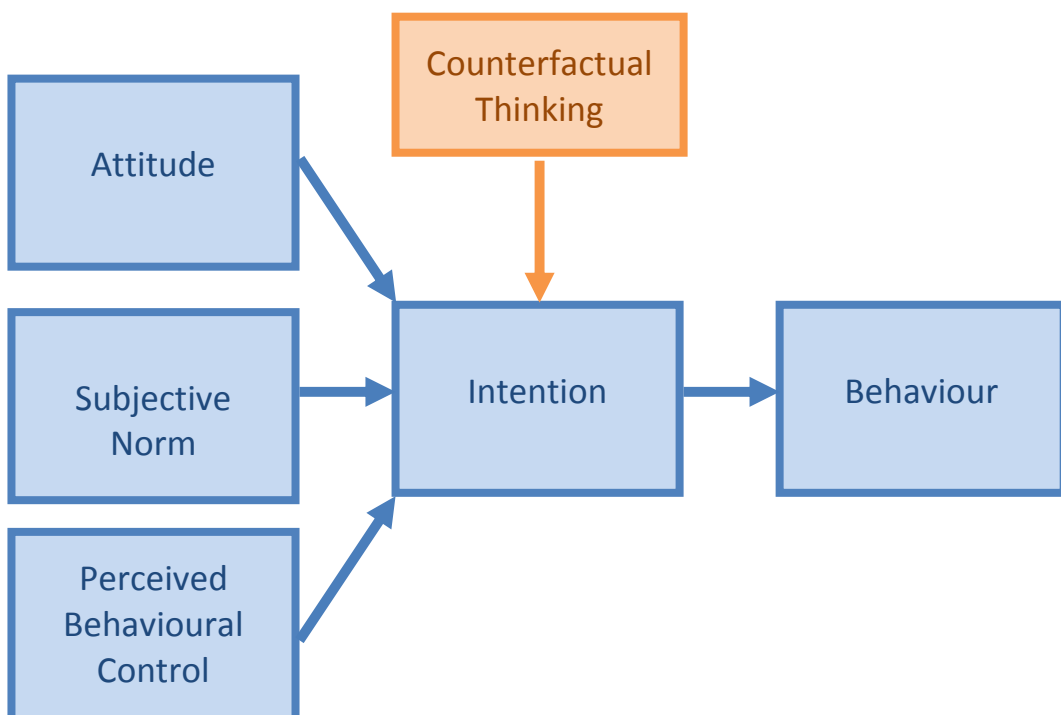


Figure 5.5. CFT supplements the TPB model by creating or strengthening a behavioural intention.

The process through which counterfactual thinking may influence intention is best explained with an example. A counterfactual thought of “If only I had paid attention to the BreastScreen reminder letters, then I would have been up to date with my mammograms” implicitly draws a causal link between paying attention to the BreastScreen reminder letters, and the outcome of being up to date with mammography screening. This causal attribution may result in a specific behavioural intention such as “Next time I will pay attention to the BreastScreen reminder letter so I can stay up to date with mammography”. Epstude and Roese hypothesise that the more specific the counterfactual thought and resulting behavioural intention, the larger the effect CFT will have on behaviour via the content-specific pathway.

Smallman and Roese (2009) present experimental evidence for the link between counterfactuals and behavioural intention via the content-specific pathway. In a series of three experiments, Smallman and Roese prompted participants to consider counterfactual alternatives to a negative outcome (e.g., having bad sunburn), and then measured response times to statements that represented a behavioural intention (e.g., “In the future I will use sunscreen”) by asking participants to provide a yes/no answer. In these experiments, thinking counterfactually facilitated faster affirmative responses to the statements, indicating that CFT does impact the formation of behavioural intentions. Further, the finding that counterfactuals facilitated responses only to behavioural intentions that matched counterfactual content provides evidence for the activation for the content-specific pathway, although actual behavioural performance was not measured in this study.

To date most of the evidence of the counterfactual-behaviour link has focused on improving outcomes in performance-based tasks (e.g., Chan, Caputi, Jayasuriya, & Browne, 2008; Markman et al., 1993; 2008; Reichert & Slate, 2000; Roese, 1994). Recently, however, interest in the counterfactual-behaviour relationship has been extended beyond performance-based behaviours, to consumer behaviour (e.g., Krishnamurthy & Sivaraman, 2002; Nan, 2008; Simonson, 1992), and of particular interest here, to health behaviour. However, the application of CFT to health behaviour change is not yet a well-investigated area. One study provided evidence that older women could produce self-focused, upward counterfactual thoughts in response to a hypothetical breast cancer scenario (Chan, Jones, & Rich, 2007a), and another found that thinking counterfactually about possible negative outcomes associated with not

having regular mammograms increased participant's self-reported sense of personal responsibility to obtain a mammogram (Chan, Jones, & Rich, 2007b). However, neither of these studies explored the effects of CFT on intention or behaviour. Only one published study to date has explicitly examined the effects of CFT on health-related behaviour change. Page and Colby's (2003) intervention asked university students to generate counterfactual thoughts in response to a vignette about a young adult suffering health complications as a result of smoking. They found that engaging in CFT (particularly additive CFT) successfully increased behavioural intention to participate in a lung capacity test, and predicted registration for such a test. The counterfactual-behavioural intention link demonstrated here is consistent with the content-specific pathway.

Given the established conceptual links between CFT and behaviour regulation, it is of practical interest to continue to explore possible applications of CFT in behaviour change interventions. Counterfactual thoughts may not only impact on performance-based behaviour, but may also exert influence over health-related behaviours, as initial evidence from Page and Colby (2003) suggests. Thus it may be possible to encourage young women to initiate upward family communication about mammography by inducing CFT as an active motivational strategy. Study 3 (presented in Chapter 8) consisted of designing and piloting an intervention that prompted young women to engage in upward CFT in response to a negative outcome vignette (a young woman's mother being diagnosed with advanced-stage breast cancer), with the aim of facilitating upward family communication about mammography.

5.8 Summary

This chapter has identified the TPB as the best candidate to provide a theoretical framework for an upward family communication intervention to promote mammography to target women. Although the TPB has demonstrated utility in predicting behaviour, this does not exclude it from consideration of extension and revision (Sheppard, Hartwick, & Warshaw, 1988). Therefore two strategies have been identified as potentially useful supplements to the TPB model: IIs and CFT. IIs come into effect after the formation of an intention, and in contrast, counterfactuals assist in the production of the intention in the first place. Thus, IIs should operate volitionally by

translating intention into behaviour, while counterfactuals should operate motivationally by strengthening intention.

Chapters 7 and 8 present studies that trialled an II intervention and a CFT intervention respectively, both with the aim of facilitating upward family communication about mammography. That both of these interventions require active participation increases their comparability. Further, conducting both of these interventions with the same population (although with different samples) allows for some comparison of the effectiveness of volitional versus motivational interventions for the desired behaviour: upward family communication about mammography. However, before the TPB model can be readily applied to this novel health-related behaviour, exploratory work must be undertaken in order to gain some preliminary understanding of the nature of this behaviour. The following studies reported in Chapter 6 present qualitative data to this effect, and also examine the use of an instrument designed to measure mother-daughter communication.

6 Study 1A and Study 1B: Communication Patterns Within Mother-Daughter Dyads

6.1 Introduction

This chapter presents two separate but related studies (Study 1A and Study 1B) that examined communication patterns between mothers and their adult daughters. As described in Chapter 4, FCP theory (McLeod et al., 1972) is a social cognitive theory of family communication that describes the processes through which families come to have a shared social reality, and it is unique because it emphasises bi-directional communication influences within the family (Koerner & Fitzpatrick, 2006). Consequently, FCP theory provides a platform for investigating upward communication. FCP theory has been described in detail in a previous section (see Section 4.2.1).

The two studies presented in this chapter sought to provide qualitative and quantitative support for the use of FCP in examining upward family communication within mother-daughter pairs. The two studies are reported consecutively in this chapter, with introductory comments, methods, results and discussion presented separately for Study 1A and Study 1B. The chapter concludes with some final remarks that integrate the key findings of each of the two studies.

6.2 Study 1A: Rationale and Aims

Study 1A sought to provide preliminary evidence for the use of a modified RFCP scale with mother-daughter pairs. While the RFCP scale in its standard form is a useful tool for measuring and describing family communication patterns (see Richie, 1990), there are some limitations of the instrument. For example, there is no explicit provision in the RFCP scale for different family structures (e.g., single parent families, blended families, nuclear families). Koerner and Cvancana (2002) discuss the tension between ecological validity and statistical control that is evident when deciding if or how to accommodate various family structures in RFCP studies. Using a sample that includes a range of family structures increases ecological validity, but sacrifices statistical control. Using a sample that is homogenous in family structure (e.g., only

nuclear families) enables statistical control, but limits ecological validity. The RFCP scale in its standard form requires the researcher to make a trade off between maintaining statistical control by using a homogenous sample, or increasing ecological validity by making allowances for various family structures.

Another limitation of the RFCP is that it allows for the identification of the communication patterns of the family as a whole, but not for a more sensitive analysis of the communication patterns between different members of the family. There is evidence to suggest that there are gender and family role differences in frequency, quality, content and/or outcomes of family communication (e.g., Lambert & Cashwell, 2004; Raffaelli & Green, 2003; Thompson, Robinson, & Kenny, 2003), which suggests that classification and analysis at the family level may not always be the most informative approach.

In response to these limitations of the RFCP scale, the current study trialled modified versions of the parent and offspring scales that were tailored specifically for use with mothers and their daughters. It was hoped that the modifications would reduce the tension between achieving ecological validity and achieving statistical control when selecting a sample. Provided the daughter was raised in a home with the mother present (even most single-parent families are headed by the mother, Birrell, Rapson, & Hourigan, 2002), using the mother-daughter tailored tool allows for the inclusion of mother-daughter pairs from families with a range of different structures (thus achieving ecological validity), and also permits some homogeneity (and therefore statistical control) to be achieved in the sample as the measurement is restricted to tapping into the communication patterns within one familial relationship.

Further, it was hoped that the modifications would allow for the assessment of communication patterns specifically between mother and daughter without sacrificing the established psychometric properties of the scales. Both the parent and offspring versions of the standard RFCP instrument have been shown to have good reliability for other samples (e.g., Fitzpatrick & Richie, 1994; Koerner & Cvancara, 2002; Richie & Fitzpatrick, 1990). Study 1A sought to establish whether the internal consistency of the modified RFCP instruments (both the parent and offspring versions) remained acceptable after being tailored for use with mother-daughter pairs.

Also assessed in this study was the level of agreement between mother and daughter evaluations of their communication patterns. Richie and Fitzpatrick (1990)

highlighted systematic differences in how different family members perceive communication patterns within their family. They found that family members disagreed as to the typology of their family in over 80 percent of cases, based on RFCP scores from 168 family triads (mother, father, offspring). However, they also noted that the correlations between mother and offspring scores were higher than the correlations within any other dyad. In response to these findings, Study 1A sought to provide preliminary data regarding the extent to which mothers' and daughters' perceptions of their communication patterns with one another were in agreement, as measured by the modified RFCP instrument.

6.3 Method

6.3.1 Participants

A sample of 45 female university students aged 17-38 years ($M = 20.03$ years) were randomly selected from an existing larger sample of women who participated in a separate study (Study 3 reported in Chapter 8). These young women were invited to participate in this study as an adjunct to the larger, separate study, and informed consent was obtained from each participant for both studies at the same time. Participants were informed that this study required the completion of a short questionnaire (modified RFCP), as well as the responsibility to invite their mothers to complete a version of the same questionnaire, and to return their mother's completed questionnaire to the researcher within a specified time frame (eight weeks). Thirty-nine of the 45 daughters returned their mothers' completed RFCP scale to the researcher. Thus the final sample consisted of 39 mother-daughter pairs. The mothers' exact ages were not obtained, however 97% indicated they were between the ages of 40-69 years, with just one mother reporting she was less than 40 years old. Approximately half (51%) of the pairs reported being from middle-income families (\$50-100,000 annual household income), with other pairs reporting annual household incomes of less than \$20,000 (13%), between \$20-50,000 (18%), and more than \$100,000 (15%). One pair declined to provide an answer to this question.

6.3.2 Materials

6.3.2.1 RFCP Scale

As discussed in Section 6.1, the RFCP instrument (Fitzpatrick & Richie, 1994; Richie & Fitzpatrick, 1990) is a measure of the conversation and conformity orientations of a family, and enables classification of families into four types: protective, consensual, laissez-faire, and pluralistic. The RFCP can be administered either to a parent or their offspring, with two slightly different versions existing for these purposes. The RFCP consists of 26 statements about communication behaviour and attitudes within the family. Eleven items make up the conformity scale (measuring the degree to which the family emphasises homogeneity of attitudes, values, and beliefs, maximum possible score of 44), and 15 items constitute the conversation scale (measuring the extent to which the discussion of a wide range of topics by all members of the family is valued, maximum possible score of 60). Both the mother and daughter versions of the scale were modified for the purposes of this project so that instead of each item referring to “my parents” or “my child(ren)”, the items referred specifically to “my mother” (e.g., “My mother often says something like ‘You should give in on arguments rather than risk making people mad’”) and “my daughter” (e.g., “I like to hear my daughter’s opinions, even when I don’t agree with her”). Participants were required to respond to the items on a four-point Likert scale (strongly disagree - strongly agree). The modified RFCP instrument appears in Appendix A.

Both mother and daughter completed the RFCP scale with reference to how their family operated while the daughter was growing up at home. This method of using the RFCP with adult offspring has been successfully used elsewhere (see Baxter & Clark, 1996).

6.3.2.2 Demographics Form

Participants also completed a short demographic form that required them to provide age and family income details.

6.3.3 Procedure

The daughters completed the RFCP scale and the demographics form either individually or in small groups of up to four at a time. Completion of both questionnaires took approximately 10 minutes. These participants then took the parental version of the RFCP and a demographics form away with them to give to their mother to complete. Participants were instructed not to assist their mother to fill in the

questionnaire, nor to discuss their own answers prior to their mother's completion of the task. It was suggested in the written instructions provided to the mothers on the questionnaire that they return the completed questionnaire via their daughter in a sealed envelope to ensure their privacy. Daughters were instructed to return their mother's completed form to the researcher within eight weeks.

6.4 Results

Using participants' responses to the RFCP scale, raw scores for each of the conversation and conformity scales were computed by summing the relevant items, resulting in a score on each orientation for each individual. The alpha reliabilities of the conversation and conformity scales were calculated separately for the mother and daughter versions of the RFCP. Table 6.1 displays the Cronbach's alpha coefficients, and demonstrates that the modified RFCP has good internal consistency. However, note that the conformity scale in the daughter's version of the RFCP yielded a lower (though still acceptable) reliability coefficient than every other scale. Previous work using the standard RFCP instrument has yielded alpha reliabilities of between .84 and .93 on the conversation orientation, and between .73 and .80 for the conformity orientation (see Baxter & Clark, 1996; Fitzpatrick & Richie, 1994; Koerner & Cavanaugh, 2002; Koerner & Fitzpatrick, 1997; Richie, 1990). Thus, the internal consistency of the RFCP was not compromised when the measure was adapted for use specifically with mother-daughter pairs, with the alpha coefficients comparable to those obtained for the original version in previous studies.

Table 6.1

Cronbach's alpha coefficients for each scale for the mother and daughter versions of the RFCP.

RFCP version	Conversation (15 items)	Conformity (11 items)
Mother	.81	.81
Daughter	.81	.72

The degree to which mothers and daughters agreed on their evaluations of their communication patterns was assessed in a series of steps. First of all, Pearson

correlations were calculated to quantify the relationships between the scores on different scales, and between mother and daughter scores (see Table 6.2). Mother and daughter scores on each of the scales were uncorrelated, indicating that there was no systematic relationship between scores of mothers and daughters and therefore no apparent agreement between the groups in their perceptions of conversational openness and conformity.

Note however that conversation and conformity scores were significantly negatively correlated within both the mother and the daughter groups, consistent with previous findings (e.g., Baxter & Clark, 1996; Koerner & Fitzpatrick, 1997). Mothers reported significantly higher scores on the conversation orientation than their daughters, while daughters reported significantly higher scores on the conformity orientation than their mothers (see Table 6.3).

Table 6.2

Pearson correlations between raw scores on each scale for mother and daughter.

	1.	2.	3.	4.
1. Conversation-mother	—			
2. Conformity-mother	-.57**	—		
3. Conversation-daughter	-.09	.07	—	
4. Conformity-daughter	.02	-.08	-.37*	—

* $p < .05$, ** $p < .01$ (two-tailed).

Table 6.3

Descriptives and t-statistics for mother-daughter comparisons of conversation and conformity scores.

	<i>M</i>	<i>SD</i>	Range	<i>t</i>
Conversation-mother	46.67	4.97	34-59	
Conversation-daughter	41.87	6.64	24-56	-3.47**
Conformity-mother	26.62	4.76	12-36	
Conformity-daughter	29.36	4.53	18-40	2.51*

* $p < .05$, ** $p < .01$

Comparing the typal classification of each individual also allowed for the assessment of agreement in perceptions of communication patterns between mothers and daughters. Each individual was classified into one of the four family types based on the median split method employed by previous FCP researchers (e.g., Fitzpatrick & Richie, 1994; Mcleod et al., 1972; Schrodtt, Witt, & Messersmith, 2008). A median split was conducted on each of the scales separately for the mother and daughter groups, so that each participant was classified as either high or low on the conversation orientation, as well as high or low on the conformity orientation (participants with scores equal to the median were assigned to the ‘low’ groups). Based on their placement on each of the orientations, participants were assigned to a family type (refer to Figure 4.1). For example, if a participant scored high on the conformity orientation but low on the conversation orientation they would be assigned to the protective type, meaning that within their mother-daughter dyad they perceived communication patterns consistent with those of a protective family.

Frequency data also indicates some level of disagreement between mothers and daughters in terms of their perceptions of their communication patterns with one another. More than 20% of the cells in the 4x4 contingency table had an expected count of less than 5, therefore violating the assumptions of a chi square test. The Cohen’s kappa coefficient was used as an alternative measure of the rate of agreement between mothers’ and daughters’ typal classifications (see Table 6.4). Mother-daughter agreement on the conversation and conformity orientation scales was no greater than chance, however the agreement rate on typal classification was higher than would be expected by chance.

Table 6.4

Agreement between mother and daughter with regard to high or low scores on each orientation, and family type.

Conversation Scale		Conformity Scale		Type	
% agree	κ	% agree	κ	% agree	κ
46	-.08	41	-.18	18	.40*

* $p < .01$

6.5 Discussion

6.5.1 Evaluation of the Modified RFCP Scale

Study 1A trialled a modified version of the RFCP instrument tailored specifically for use with mother-daughter pairs. This modified RFCP scale was used to measure participants' perceptions of the communication patterns within the dyad, particularly with reference to how they were placed on the conversation and conformity orientations. The tailoring of the questionnaire did not compromise the internal consistency of the measure, as the alpha coefficients were comparable with those obtained for the original version in previous studies (see Baxter & Clark, 1996; Fitzpatrick & Richie, 1994; Koerner & Cavanaugh, 2002; Koerner & Fitzpatrick, 1997a; Richie, 1990). Acceptable alpha reliabilities were obtained for the conversation and the conformity orientation scales, for both the mother and daughter versions of the questionnaire. This demonstration of internal consistency of the modified RFCP gives some indication of the reliability of this measure, and its possible utility in future studies that examine communication patterns between mother and daughter.

It is apparent from the results of Study 1A that mothers and daughters had different perceptions of their communication patterns with one another. This finding is consistent with Richie and Fitzpatrick's (1990) results, which indicated that the majority of family triads (mother, father, child) were in disagreement about their typology. In the current study, mothers perceived communication patterns within the dyad to be more conversation-oriented than daughters did, while daughters perceived the communication patterns to be more conformity-oriented than mothers did. These results indicate that mothers perceive the communication patterns with their daughters to be more open and bi-directional than their daughters do. The tendency for mothers to perceive more open conversation and for offspring to perceive more conformity has also been noted by other researchers (e.g., Fitzpatrick & Richie, 1994; Richie, 1990). Mothers may perceive their family interactions to be more open and bi-directional than what they are in actuality because they are motivated to present their family in the most positive light possible (socially desirably responding). In contrast, offspring may have a tendency to be critical of their parents and thus respond in ways that paint a more unflattering picture of family interactions. Alternatively, daughters may present to their mothers as though they are

being open about a range of issues in their life, but in actuality they remain private and closed on selected topics unbeknownst to the mother (demand effects).

6.5.2 Limitations

One purpose of the current study was to determine whether the reliability of the RFCP prevailed after modifications were made to the instrument to tailor it for use specifically with mother-daughter dyads. The current study demonstrates that the modified RFCP has good internal consistency. However, due to limitations of time and resources the consistency of the instrument over time was not assessed in the current study. It would be beneficial for future work to conduct a test-retest reliability analysis on the modified RFCP.

While Study 1A demonstrated the reliability and utility of a modified RFCP instrument tailored to mother-daughter pairs, it did not investigate any qualitative differences in communication between types as measured by this instrument. Thus, one of the aims of Study 1B was to investigate whether any qualitative differences in mother-daughter communication could be identified based on the typical distinctions as measured by the modified RFCP.

Further, no qualitative analysis of mother-daughter relationship quality was conducted. Such an analysis could provide some context around the result that mothers and daughters perceived their communication patterns differently. However, such an analysis was beyond the scope of the current study.

6.5.3 Conclusion

While mothers and daughters demonstrated that they perceived their communication patterns with one another differently as measured by the modified RFCP, these differences were consistent with trends observed in previous work conducted with the standard RFCP. That the modified RFCP instrument uncovers the same patterns as the standard RFCP instrument lends further support to its reliability and utility in future work. Given this preliminary evidence for the reliability for the modified RFCP scale, Study 1B employed this instrument to classify mother-daughter dyads into FCP types for the purposes of determining whether there were differences in their reported communication patterns.

6.6 Study 1B: Rationale and Aims

The purpose of Study 1B was to obtain descriptive, qualitative data that addressed two primary research questions:

1. What is the nature of the downward and upward health communication patterns within mother-daughter dyads, particularly with regard to mammography?
2. Are there differences in communication as reported by mothers compared to daughters?

In addressing these questions, it was anticipated that Study 1B would provide qualitative evidence for the feasibility and utility of promoting upward family communication about health, with subsequent studies seeking to provide convergent evidence in other forms (see Chapters 7 and 8). Little other work has investigated the presence or absence of upward communication within mother-daughter pairs, and the potential effects of that communication. However, a noteworthy exception is the work by Mosavel and colleagues, already discussed in detail in Section 4.2.2. To briefly review, they found that within a South African sample, mothers reported looking to their daughters for information and advice on a range of issues, including health (Mosavel, et al., 2006). Further, African-American and Latino young women reported in focus groups that they often provided health information to their mothers (Mosavel & Thomas, 2009). Study 1B aimed to extend on the work of Mosavel et al. by gathering evidence of daughters' willingness and ability to engage in upward family communication in an Australian context, and in a context where there may be less of a gap between generations in terms of educational opportunity and experience.

A secondary aim of Study 1B was to explore any qualitative differences in self-reported communication patterns between mother-daughter dyads of different FCP types, as measured by the modified version of the RFCP scale outlined in Study 1A. Thus, a third research question was necessary:

3. Are there differences in communication between dyads of different FCP types?

Previous research that has used the RFCP scale has demonstrated behavioural differences between families of different types (e.g., Baxter & Clark, 1996; Chaffee et al., 1971; Koerner & Fitzpatrick 1997a, 1997b; McLeod, et al., 1972; Rose, Bush, & Kahle, 1998). As discussed in Section 4.2.1, Saphir and Chaffee (2002) found that the conversation orientation influenced the nature of communication patterns within a

family. In particular they found that upward family communication about politics was more frequent within conversation-oriented families (i.e. pluralistic and consensual families). Similarly, it was anticipated that dyads in the current study who scored high on the conversation orientation would be more likely to evidence open, bi-directional communication than dyads who were low on the conversation orientation.

6.7 Method

6.7.1 Participants

Mother and daughter pairs were recruited from the Illawarra and Southern Sydney regions to participate in this semi-structured interview study. While 12 mother-daughter pairs agreed to participate, only the data of eight pairs are reported here. For three of the excluded pairs, only one of the family members completed the participation requirements for the study, and thus had to be excluded from the analysis. An additional pair was withdrawn from the study at their request some months after the interview was conducted. The mother reported that in the intervening time, the relationship between her and her daughter had been fractured (due to an issue unrelated to the study) and they did not wish to have data that described their relationship reported on in this thesis or any other publication. This chapter therefore reports only on the data of eight mother-daughter dyads. The small sample size enabled multiple qualitative analysis techniques to be applied to the data, a process that may have been burdensome if a larger sample size was employed.

In the instance that a mother participant had more than one adult daughter, only one participated. Participants were recruited through the placement of fliers and posters in women's gyms, doctor's surgeries, libraries, schools, and university notice boards, as well as community announcements in local papers. Advertising the study at a variety of locations increased the chance that both mothers and daughters had the opportunity to be the first point of contact. The study was advertised as a project on "family communication and health" that required mother-daughter pairs to participate, and all material encouraged interested parties to make contact to discuss the requirements of participation. When interested parties made email or telephone contact the researcher offered to post them two identical information packs (one for themselves and one for their mother or daughter) which detailed the expectations, procedure, time commitment, and any risks or ethical issues that were associated with participation in the study. The

information packet invited mothers and daughters who wanted to proceed with participation to make contact with the experimenter to arrange an appointment. Each participant was offered a \$10 Coles-Myer voucher to compensate for her time.

The sample of Study 1B was independent to that used in Study 1A. The final sample consisted of mothers between the ages of 50-66 years ($M = 57;03$) and daughters between the ages of 18-39 years ($M = 27;08$). These approximate age ranges for mothers and daughters were targeted directly because a sample of mothers of screening age as defined by BreastScreen Australia was desirable, and daughters that were too young to be undergoing regular screening assisted in the distinction between the two groups for the purposes of the current study. One mother who participated in this study reported having had breast cancer, and was in remission at the time of participation. That one mother participant in this sample ($N = 8$) reported having had breast cancer is consistent with the national statistics that indicate one in eight women are diagnosed with breast cancer. Table 6.5 displays other demographic details of interest.

Table 6.5

Frequency counts for mothers and daughters by categorical demographic variables.

Demographic Variable		Mother	Daughter
Marital Status	Single (never married)	1	3
	Married/Defacto	5	3
	Separated/Divorced	2	1
	Widowed	0	1
Highest Level Education	Year 9	1	0
	Year 10	2	0
	Year 12	0	2
	Vocational training	4	2
	Undergraduate university degree	0	3
	Postgraduate university degree	1	1

6.7.2 Materials

6.7.2.1 Interview Schedule

An interview schedule was prepared that was identical for both mothers and daughters. Participants were encouraged to tell illustrative narratives of circumstances, events or instances that represented their communication with their mother/daughter generally, about health-related issues, and then specifically about breast health and mammography. In particular participants were asked to recall and describe instances where they had influenced their mother/daughter, and where their mother/daughter had influenced them (e.g., “Can you tell me about a time when your daughter influenced a decision you made about your health?”). Participants were also asked to respond to a hypothetical narrative about a daughter bringing up the topic of mammography in conversation with her mother. The interview was semi-structured, with pre-prepared stem questions for each theme. Follow-up questions were asked if necessary and when relevant. See Appendix B for the full interview schedule.

6.7.2.2 RFCP Scale

Both mother and daughter completed the modified RFCP scale (see Section 6.3.2.1 for more detail on this instrument) with reference to how their family communicated while the daughter was growing up at home. The reliability of the daughter conformity scale ($\alpha = .90$), and the mother ($\alpha = .77$) and daughter ($\alpha = .84$) conversation scales for the current sample were acceptable. The mother conformity scale exhibited poor internal consistency ($\alpha = .58$), though this may be due to the small sample size. Note that this same scale exhibited good internal consistency when used with a demographically similar sample of mothers in Study 1A.

6.7.2.3 Demographics Questionnaire

All participants completed a short questionnaire that asked them to record demographic details of interest such as age, marital status, and education.

6.7.3 Procedure

Mothers and daughters were interviewed separately, and these interviews were conducted in a variety of locations. In the first instance participants were invited to

come to the university to meet with the interviewer, and if that was not possible a neutral environment was selected (e.g., private room in a local library). In a few instances (e.g., when the woman had child care duties in the home during the day) the interview was conducted in the participant's home. With the exception of one mother-daughter pair whose interviews were conducted on consecutive days, mother-daughter pairs were interviewed on the same day in the same location.

All interviews were recorded with an MP3 recorder. All participants provided informed consent to participate in the interview and for the interview to be recorded. Each participant was identified with a unique code that distinguished her audio file, transcript, and questionnaires from those of other participants. Participants were advised that they could use codes or pseudonyms when speaking of their mother/daughter or other any other person during the recorded interview if they wished. None chose to do so. Each participant was assured by the interviewer that all data would remain confidential, and that a daughter's comments during the interview would not be shared by the interviewer with her mother, and vice versa.

After the interviews each participant completed the questionnaires. Participation in the interview and completion of the questionnaires took between 60-90 minutes in total. Upon completion, participants were fully debriefed on the purpose of the study and were provided with an information brochure issued by BreastScreen Australia about mammography. In the instance that a participant's mother/daughter was being interviewed at a later date, they were encouraged not to discuss the topics covered in the interview with their family member until both parties had been interviewed.

6.7.4 Data Analysis

6.7.4.1 Interview Data

All interviews were transcribed verbatim, and the transcripts were compared with the audio recordings to ensure accuracy. The transcripts were subject to both manual and computerised content analysis, each method being employed for a different purpose. Computerised content analysis procedures offer an efficient way in which to get an overview of the data. However, they are limited by their ability to only capture syntactic properties of the text, and consequently the meaning or significance of a particular narrative may go undetected. Therefore manual coding was employed to allow for the examination of a subset of the data that dealt with if and how mothers and

daughters influenced one another with regard to health, and specifically mammography. These issues were of particular interest as part of the exploration of the viability of an upward family communication health intervention. A preliminary coding frame was developed using a method informed by the principles of grounded theory. Based on initial readings of the transcripts, preliminary categorisation of data, and knowledge of themes that had emerged in similar previous studies (e.g., Mosavel et al., 2006), the author developed an initial coding frame. Four interviews were chosen at random (two daughters, two mothers) to trial the coding frame. The researcher and an additional coder analysed the randomly sampled transcripts, and added to and modified the coding frame throughout the trial analysis process as necessary. At the end of this trial process, coders agreed on 78% of codes in the frame, with discrepancies resolved through discussion. This process resulted in a comprehensive coding frame consisting of more than 60 codes that was used by the author to analyse all transcripts (including re-analysing the transcripts which were used for the trial analysis). Some quotes are included in the presentation of the interview data in this chapter. Quotes were selected on the basis of being both characteristic of responses, and succinct.

The transcripts were also subject to a computerised content analysis procedure using Leximancer for the purposes of detecting any differences in reported communication between groups (between mothers and daughters, and between dyads of different types based on RFCP scores). Leximancer is a text analysis and data-mining software with demonstrated reliability and validity (see Smith & Humphreys, 2006). Leximancer permits both conceptual analysis (measuring the frequency of themes or concepts) and relational analysis (measuring the interrelatedness of the concepts) of the text to be conducted simultaneously, and produces a concept map that is a visual representation of: (1) the main concepts in the text and their relative importance, (2) the relationships between concepts, and (3) the contextual similarity within which the concepts occur. On the resulting conceptual map, brightness, size, and location of each concept point provides information about the concept. The brighter the visual representation of the concept, the more frequently it appeared in the text. The larger the concept point, the more connected it is to other concepts. Finally, the closer two concepts appear on the map, the more likely they are to have appeared in the same context in the text.

Leximancer automatically learns concept seed words from the text, which are usually the most frequently appearing words (with the exception of ‘stop words’ which are words with low semantic meaning; e.g., “and”, “yeah”, “to”, “the”). Through an iterative process, Leximancer identifies a collection of terms that are correlated with the seed word to be included in the concept definition. Terms are added to the concept definition based on frequency of co-occurrence with the seed word in the text, as compared to their occurrence elsewhere in the text. Terms highly relevant to the seed word are those that frequently co-occur with the seed word but seldom appear elsewhere in the text. Such terms are likely to be included in the concept definition. Terms with lower relevance may still co-occur with the seed word, but also frequently appear elsewhere in the text apart from the seed word. Such words are unlikely to be included in the concept definition. For example, in a book about psychology, “personality” might be a concept seed word, with words such as “trait” and “dimension” added to the concept definition because they frequently co-occur with the word “personality”, and infrequently appear in blocks of text apart from the word “personality”.

While these processes are automatic, Leximancer also allows the user to suggest their own seed word, to merge automatically identified seed words together if they are sufficiently similar or refer to the same thing (e.g., “trait” and “attribute”), and to manually add words Leximancer has identified in the text to a concept definition (e.g., add “characteristic” to the definition of “personality”).

A sentence (or group of sentences) in the text is then identified as containing a concept if the evidence within the section of text is above a certain threshold as defined by Leximancer, and then the co-occurrence of the concepts identified in the text is measured for the generation of the concept map.

Two separate computerised analyses were run on the entire set of interview data. The first simply examined any differences between the concepts and themes addressed by daughters, compared to mothers. This analysis was conducted by “tagging” daughters’ speech and mothers’ speech separately, and including these tags as concepts within the conceptual map. This approach allowed for the identification of concepts and themes that are frequently mentioned by daughters relative to mothers, and vice versa.

The second analysis compared the content of the speech of women from different family types. Based on their scores on the modified RFCP, mother-daughter pairs were classified as one of the four types. Using the same method as in the first

analysis, data from women from the different types of families were tagged with the relevant label, which was included in the concept map as a way of providing information about frequently occurring concepts and themes for women from different family types, relative to women from other family types. The purpose of this analysis was to allow for the examination of any qualitative differences in communication reports between dyads of different types.

For both Leximancer analyses, the automatically defined concepts were edited in order to merge similar concepts, eliminate concepts based on high frequency words that were being used in a context where they had low semantic meaning, and to add concepts that were of interest because they reflected the purposes of the study. Identical edits were done for both analyses. The concepts ‘think’ and ‘thought’ were merged. The concepts “year”, “years”, “back”, “kind”, “time”, and “day” were deleted as they were either used in contexts where they contributed little or no meaning (e.g., “kind of thing”), or were used in such a wide variety of contexts that they could not accurately be conceived as a unified concept (e.g., “back” was used as a noun, an adjective, a verb, and an adverb all within the one concept). The concept “mammogram” was created (using both “mammogram” and “mammograms” as seed words) with the purpose of investigating what other concepts this was related to. The concept “conversations” was created (using “conversation”, “conversations”, and “communicate” as seed words), again with the purpose of determining its connectedness to other concepts. Finally, the concept “change” was created (using “change” and “changed” as seed words) in order to represent the notion of influence, which was a key idea in this study of family communication within mother-daughter dyads.

The process of producing a concept map in Leximancer is stochastic, meaning that while there are predictable and controllable aspects to the process, there is also an element of non-determinism. Thus, each analysis was run three times to ensure the map was stable. No gross changes in structure of the concept maps were apparent between analyses, and in each instance the final map was attained in between six and 11 iterations, indicating map stability.

6.7.4.2 RFCP Scale

Raw scores for each of the conversation and conformity orientation were computed by summing the relevant items. Given that the results of Study 1A indicated

that mothers and daughters perceived communication patterns within the dyad quite differently, raw scores were converted into standard scores (z scores) for each individual. This method was employed by previous FCP researchers (e.g., Koerner & Cvancara, 2002; Koerner & Fitzpatrick, 1997) to account for role-specific differences in the perception of family communication patterns. Standard scores on each of the orientations were averaged within each mother-daughter dyad to give the dyad a set of shared conversation and conformity scores. A median split was then performed on these scores to classify each dyad as either high or low on the conversation (median score of .25) and conformity (median score of -.09) orientations. Again, this method has traditionally been employed by FCP researchers (e.g., Fitzpatrick & Chaffee, 1994; Koerner & Cvancara, 2002; Koerner & Fitzpatrick, 1997a; Mcleod et al., 1972; Schrod, et al, 2008). Based on their placement on each of the orientations, the pairs could then be classified according to the family communication pattern types. For example, a mother-daughter pair who scored high on the conversation orientation but low on the conformity orientation was classified as pluralistic. Table 6.6 below displays mean raw scores within pairs for each orientation, as well as each pair's typal classification.

Table 6.6

Mean standard scores and typal classification for each mother-daughter dyad.

Pair	Conversation	Conformity	Type
Mother-Daughter 1	.2	-.62	Laissez-faire
Mother-Daughter 2	-.33	.74	Protective
Mother-Daughter 3	.38	.55	Consensual
Mother-Daughter 4	.11	-.42	Laissez-faire
Mother-Daughter 5	.29	.64	Consensual
Mother-Daughter 6	.55	-.52	Pluralistic
Mother-Daughter 7	-1.66	.25	Protective
Mother-Daughter 8	.46	-.62	Pluralistic

6.8 Results: Manual Content Analysis

The subset of interview data used for the manual content analysis was classified into one of three broad themes according to the purposes of this study: downward

communication about health (data relating to mother-initiated conversations, or circumstances in which the mother has influenced the daughter), upward communication about health (data relating to daughter-initiated conversations, or instances in which the daughter has influenced the mother), and communication of any kind about mammography (including mammography-related conversations that participants had experienced within their mother-daughter dyad, their reflections on the hypothetical vignette, and their thoughts about possible communication of this nature with their mother/daughter in the future). Where data could have been classified as more than one of these broad themes (e.g., downward communication about mammography), the mammography theme was first applied, with subsequent codings reflecting whether communication was upward or downward in nature. Each one of the three broad themes identified here is explored in more detail below.

6.8.1 Downward Communication and Influence

Mothers and daughters from seven of the eight pairs mentioned instances where downward health communication was evident within their mother-daughter dyad. Downward communication was defined as any instance of the mother initiating communication with the daughter regarding a health-related issue. Common topics of conversation reportedly initiated by mothers were sex and contraception, exercise, nutrition, pap smears, and mental health issues. Mothers frequently reported that they broached these conversations with the purpose of influencing their daughter to adopt a particular behaviour or attitude, or with the aim of educating their daughter by sharing information with her. However, while mothers tended to report subtle, suggestive techniques such as asking questions and making hints, daughters tended to perceive their mothers' attempts at influencing them as quite directive and forward:

“Mothers don’t push, mothers only plant seeds.” *Mother-8*

“She said ‘No, get it checked’ and she pushed me. Like, I didn’t go and she rang me and said ‘Did you go to the doctor’s?’ and I said ‘No’, and she said ‘Go’.” *Daughter-6*

Despite the daughters' perceptions that their mothers attempted to influence them in a directive fashion, there were many indications that they received their mothers' attempts at conversation and influence in a generally positive manner. However, there was a distinct sense that when it came to downward communication about more personal or sensitive issues, daughters were less inclined to receive their mothers' advances positively. Some mothers spoke of this with some sadness, as reflected in the following comment:

"So I wanted to tell them, in some sort of way, make sure you like what's happening to your body. That didn't get very far and so we just don't have that conversation these days. I still would like to." *Mother-4* (regarding sex)

Overwhelmingly, both mothers and daughters reported that the mothers' attempts to initiate a conversation about a particular health topic, or their attempts to influence the daughter regarding particular health behaviours, were successful. This was true even when the daughter described having been unreceptive to the mother's advances:

"But mum was keen for me to try [naturopathic treatment] because she was a bit freaked out about somebody drilling holes in my head so I was all right with that. I was desperate enough to try anything, so she and I drove to Windsor where her naturopath was." *Daughter-1*

"I think she did some counselling after her husband died...And it took a lot to get her [to seek counselling], I actually had to blackmail her. She said 'I'll do it if you do it' because she knows I've got issues and crap and what have you, and I said 'OK' but I didn't do it and she did". *Mother-4*

Some women were inclined to discuss the health communication within the context of their mother-daughter relationship more generally. In these instances, women would often comment on whether or not it was characteristic of themselves/their mother to initiate downward communication. These remarks assisted in giving an overall picture of family communication patterns, in that they allowed for some extrapolation

about whether the instance the participant was discussing was salient because it was unusual, or whether it was an illustrative example of normal communication patterns. Of mothers and daughters who volunteered such information, more than half explicitly mentioned that the example described was characteristic of downward communication patterns within the dyad:

“She never really judges me. She just supports me. She pretty much does that with everything.” *Daughter-6*

“She’s rather reserved, and that’s why I don’t pry unless she approaches me”.
Mother-8

Note however that some women did suggest that downward communication and influence within the dyad was not characteristic of their relationship:

“She doesn’t fall into the classic mum role very often. Like I said, the power is a little bit reversed.” *Daughter-1*

“And I’ve always not – well women’s business anyway – I’ve always not listened to her and I still don’t listen to her.” *Daughter-2*

6.8.2 Upward Communication and Influence

Seven out of the eight pairs indicated that upward communication and influence about health were present within the mother-daughter dyad. Upward communication was defined as any instance of the daughter initiating communication with the mother regarding a health-related issue. In the eight pair, the mother reported an example of upward health communication, whereas her daughter described a complete absence of daughter-initiated communication about health. Common topics of conversation reportedly initiated by daughters were dietary changes, exercise and fitness, quitting smoking, and medical check-ups. Without exception both daughters and mothers reported that the upward communication was the daughters’ attempt to influence the mothers’ health behaviour. Daughters were far more likely than their mothers to be

directive in their attempts to communicate about and influence their mothers regarding a particular health issue:

“I used to always be at her to give up smoking, because you know it’s really bad for you and things like that. I finally convinced her to give up smoking.”

Daughter-8

“She says I’m too fat.” *Mother-2*

Upward communication and influence attempts were more likely to be received negatively by the mothers (perhaps due to the more directive approach daughters took), and were less likely to result in behaviour change, than downward communication:

“I suppose it’s that whole thing of ‘I’m beautiful, you’re not quite as beautiful’. I’m saying it probably in a little bit of a nasty way...I’m very against that because I think it causes a lot of problems”. *Mother-2* (regarding weight loss)

“Health freaks me out a bit and I don’t think she’s very good at looking after her health, and we don’t talk about it because she gets cranky if I broach the subject”. *Daughter-4*

Having said that, daughter-initiated attempts at communication and influence that *were* received positively were successful in facilitating the change in behaviour the daughter was advocating for:

“She bought us the books that I mentioned previously and some of these were cooking books on things that should be eaten for people with a particular type of cancer. So we just followed some of those guidelines”. *Mother-5*

“I’ve taken notice of her, the things that she’s told me”. *Mother-7*

“I’ve started eating eggs because of my daughter and I’ve started eating cheese because of my daughter”. *Mother-8*

As with the discussion about downward communication, some women described the instances of upward health communication within the context of their mother-daughter relationship more generally. Participants frequently commented on whether or not it was characteristic of themselves/their daughter to initiate upward communication. Twelve of the 16 participants (six mothers and six daughters, not all of which were matching dyads) indicated that upward communication and influence was characteristic of the communication patterns within the dyad, as reflected in the following comment:

“It’s usually me doing the input”. *Daughter-5*

6.8.3 *Communication about Mammography*

Previous communication about mammography was reported by seven out of the eight pairs. In the eighth pair, both mother and daughter indicated they had never previously communicated about mammography. All of the seven pairs reported that these conversations were initiated by the mother, and were usually just short, seemingly insignificant, information-sharing discussions where the mother simply reported having gone for a mammogram (screening or diagnostic) recently:

“She’d say ‘I’m going to have my breast screen’ or something like that. But we’ve never really gone into the details of it”. *Daughter-3*

A small number of women (predominantly daughters) also reported more extensive downward conversations where the mother shared with the daughter some of the less pleasant aspects of mammography. Women indicated that this was often done in a light-hearted or joking manner:

“She’s got no boobs, so we talk about how I’ve made up for her in the boobs department. And she said they squash them and it’s hard because she’s got nothing to squash. So we have talked about it. It’s just a funny thing”.
Daughter-4

The instances of upward communication about mammography that were recalled by participants were all precipitated by the daughter finding a breast lump, or personally experiencing some other breast-health issue. Consequently, these conversations appeared to have resulted in downward influence, with the mother assisting or supporting the daughter as she sought the necessary medical assistance.

“I found a lump in my breast and I said to Mum ‘I keep getting a sore boob’. We’d be out or whatever and I’d go ‘I’ve got a pain in my boob again’ and she said ‘Why don’t you get it checked?’”. *Daughter-6*

“When I first found my lumps I needed to know from Mum what the family history was because I knew I’d need to give it [to medical professionals]”. *Daughter-7*

All participants were asked to imagine a hypothetical scenario where a mother and daughter “just like you” were talking, and the daughter raised mammography as a conversation topic. Participants were asked to imagine what reasons or motivations the daughter might have to initiate this conversation. The most frequent response (almost 40% of all responses; note that most participants offered more than one response) from both mothers and daughters was that a daughter is most likely to raise this issue in conversation if she herself has a breast-health issue, or requires some information about mammography for some other purpose. Thus, participants’ hypothetical musings were consistent with their reports of their experiences: that daughters would initiate a conversation about mammography to elicit downward influence and assistance i.e. for their own purposes:

“Just to ask her what it was like – any tips or pointers. What to do or not to do.” *Daughter-1*

“She might have noticed a change in her own breast and she doesn’t know whether that’s normal or abnormal.” *Mother-7*

However, a substantial proportion (26%; again note that most participants offered more than one response) of responses also indicated that a primary reason the daughter might raise the topic of breast screening with the mother is to check on the mother's screening knowledge and behaviour. Both mothers and daughters suggested that a daughter might raise the topic because they were concerned for their mother's health, to check whether the mother was aware of the need for breast screening at her age, and to see if she was having regular screening:

"Probably to know whether the mum is going to get checked and is going to be OK because you want to know if she's got breast cancer or not." *Daughter-2*

"Well she might be checking on her own mother's health to make sure the mother's doing the right thing." *Mother-5*

Other reasons identified less frequently by participants included wanting to discuss a friend or relative who had experienced breast-health issues, or to discuss a television advertisement or magazine article about mammography.

Finally, participants were also asked to imagine what reasons the daughter might have for *not* wanting to raise this topic of conversation with their mother. Most responses reflected either the potential awkwardness that could ensue if the daughter initiated a conversation about something that may be construed as private or sensitive, or the possibility of emotionally upsetting the mother by raising the topic.

"I suppose breasts are a personal body part and not everyone wants to tell her mum what's happening with personal body parts maybe." *Daughter-1*

"Perhaps the mother had a traumatic time with breast cancer and doesn't want to remind her of it, or something." *Mother-6*

Other potential barriers identified less frequently by participants were the perceived irrelevance of the conversation, not having a close mother-daughter relationship, and not having enough time to have such an in-depth discussion.

6.9 Results: Mother-Daughter Leximancer Analysis

The purpose of this analysis was to examine any differences in the speech of mothers compared to daughters. This was achieved by observing which concepts were highly related to mothers' speech, compared to those highly related to daughters' speech. Figure 6.1 is the concept map that resulted from this analysis. As discussed in Section 6.7.4.1, the brighter the concept point, the more frequently it occurred in the text; the larger the concept point, the more connected it was to other concepts; and the closer two concept points are, the more likely they were to appear together in the text. The concept TG_MOTHERS_TG represents speech tagged as belonging to mothers, while the concept TG_DAUGHTERS_TG represents speech belonging to daughters. The closer a concept point is to the daughter tag on the map, the more likely it is that the concept was found within daughters' speech, and likewise for concepts that appear close to the mother tag.

One difference that is highlighted by the map is that daughters have frequently referred to their "Mum" in their speech, while mothers have frequently referred to their "daughter". This is merely reflective of the nature and purpose of the interview, which required each individual to be referring to the other member of their dyad. A more interesting difference can be seen in the relative position of the "breast", "cancer", and "health" concepts. Mothers were more likely to discuss breasts, particularly with reference to breast cancer, whereas daughters were more likely to discuss health more generally. The location of the concept "talk" on the map suggests that this concept is far more connected with daughters' speech than mothers' speech. However, the relative count data presented in Table 6.7 indicates there is actually little difference in the frequency with which the two groups mentioned "talk". This concept was reflected in the speech of mothers and daughters when they described what they usually "talk about" with one another. Other frequently occurring concepts within the mothers' and daughters' speech were also very similar between groups (see Table 6.7). That the two groups did not vary greatly in the concepts covered in their speech is also evident in the map. It can be observed in the concept map that many of the concept points appear approximately equidistant from the mother and daughter tags. This indicates that concepts such as 'think', 'time', and 'people' appeared about as frequently in mothers' speech as daughters' speech.

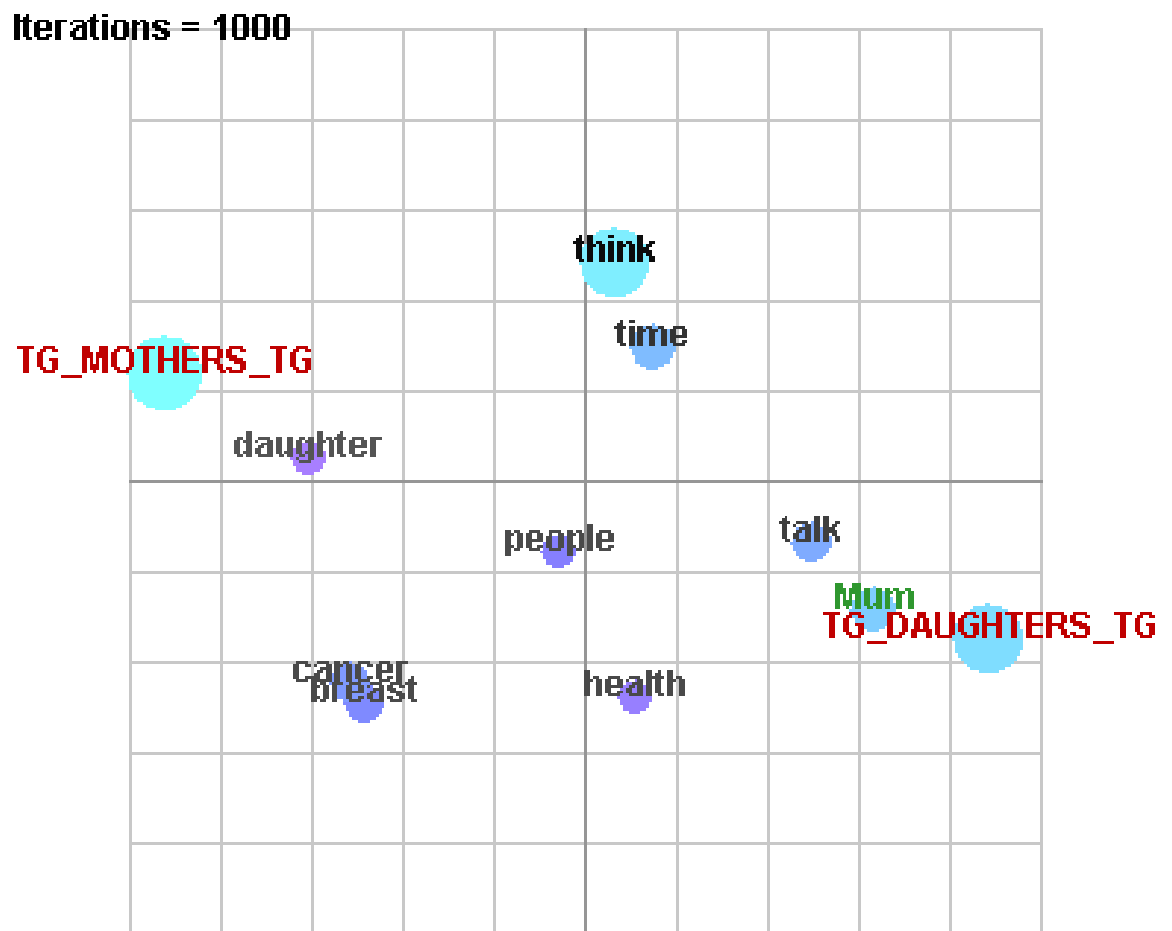


Figure 6.1. Concept map for mothers and daughters' speech.

Table 6.7

Frequently occurring concepts for mothers as compared to daughters.

Participant	Rank	Concept	Relative Count*
Mothers	1	Think	40.8
	2	Time	14.1
	3	Talk	9.4
	4	Cancer	8.6
	5	Breast	8.5
Daughters	1	Think	38.1
	2	Mum	22.7
	3	Time	13.4
	4	Talk	10.1
	5	Health	7.7

*Relative count is a percentage indicating the number of times the concept co-occurs with the tag (i.e. “mothers” or “daughters”) relative to the number of times the concept occurs in all the text.

6.10 Results: Typal Leximancer Analysis

The purpose of this analysis was to examine any differences in the speech of participants from different dyad types. As with the mother-daughter Leximancer analysis, this was achieved by observing which concepts were highly related to the different dyad types. Figure 6.2 is the concept map that resulted from this analysis. The concepts labelled TG_PLURALISTIC_TG, TG_LAISSEZ-FAIRE_TG, TG_PROTECTIVE_TG, and TG_CONSENSUAL_TG each represent speech tagged as belonging to mother-daughter pairs of that type. The closer a concept point is to an FCP type tag on the map, the more likely it is that the concept was found within the speech of mother-daughter pairs of that type.

Examination of the ranked concept lists for each type revealed that there was little variation between types with regard to the top three most frequently occurring concepts, but there was substantial variation in subsequent concept ranks. Tables 6.8 and 6.9 display the eight most frequently occurring concepts for each type. Some interesting differences are observable between types. It is evident both from the proximity of the concept points (see Figure 6.2) and from the high relative counts (see Table 6.9) that dyads high on the conversation orientation (that is, consensual and pluralistic dyads) were more likely to report mother-daughter communication about a wider range of concepts. These mother-daughter dyads frequently spoke of their friends, and how they themselves or others were feeling. Of particular relevance to the purposes of this study is that dyads high on the conversation orientation were more likely to make attempts at influencing one another by sharing their opinions, as indicated by the frequently occurring concept “should” (see Table 6.9). This result confirms the expectation that high conversation orientation dyads are more likely to have open, bi-directional discussions. Extracts automatically identified by Leximancer provide additional support for this particularly interesting result:

“She’s always telling me like, because I’m an EN [Enrolled Nurse], so she thinks I should go to Uni and do my RNs [Registered Nurse] but I don’t know.” *Daughter-6*

“But [my daughter] might bring it up thinking ‘Okay is it something that mum should be doing...Is it something that really should be done for her on a regular basis?’...Yeah, so she might bring it up as a matter of consequence, like ‘have you done this or have you managed to catch up with these sort of scenarios’”. *Mother-8*

In contrast, dyads with a low conversation orientation (protective and laissez-faire dyads) discussed fewer topics with a high frequency, as indicated by both the small number of concept points in close proximity to these labels on the map, and the overall lower relative counts of all the eight most frequently occurring concepts (see Table 6.8), compared to those evidenced by high conversation orientation dyads. However, it is apparent (again, from both the location of the concept points

on the map and the relative counts displayed in Table 6.8) that low conversation orientation dyads were more likely to refer specifically to health than high conversation orientation dyads.

The influence of the conformity orientation is less clear, as has been observed by previous researchers (e.g., Koerner & Cwancara, 2002). The map (Figure 6.2) demonstrates that there are fewer polarisations of the concepts along the conformity orientation than the conversation orientation, as demonstrated by the lack of concepts placed on the extreme ends of the y axis. Likewise, examination of the relative counts displayed in Tables 6.7 and 6.8 suggest that there is no consistent differences in the frequency of concepts mentioned by high and low conformity dyads.

Iterations = 1000

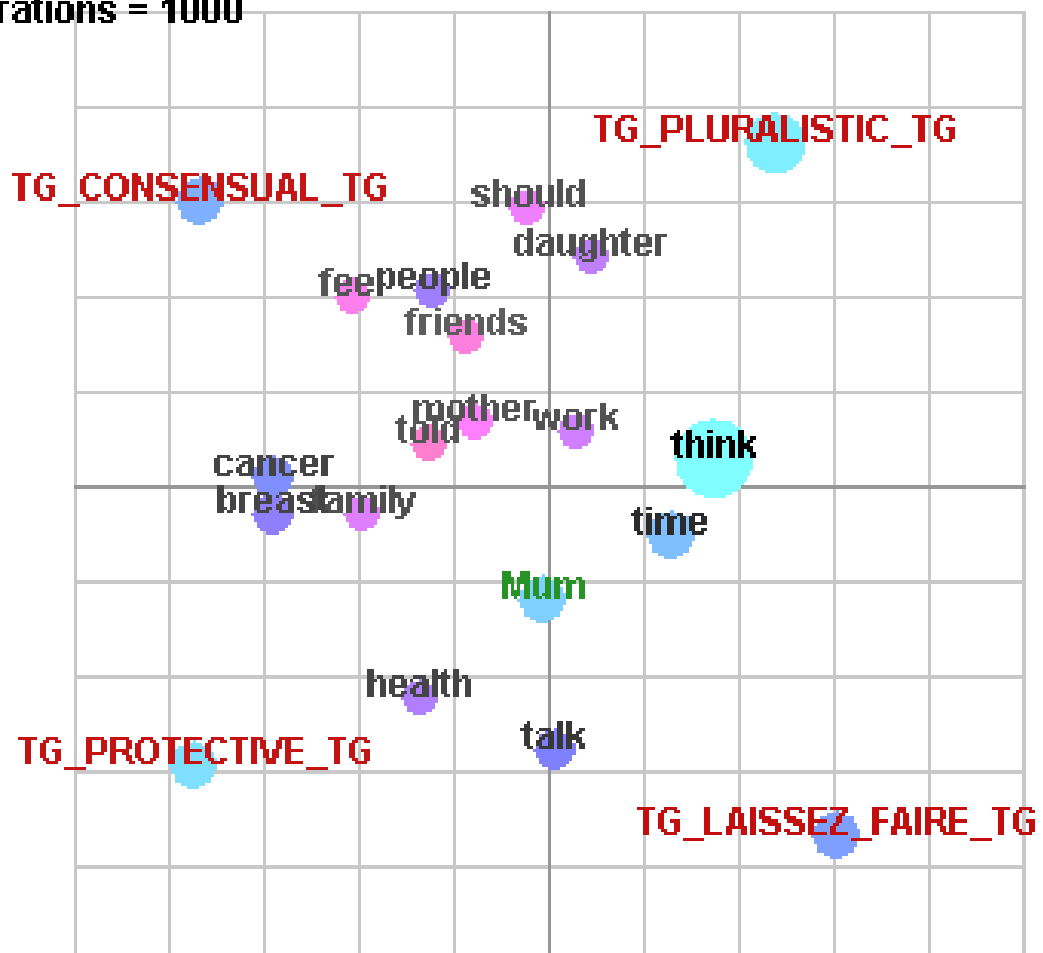


Figure 6.2. Concept map for the speech of dyads of different FCP types.

Table 6.8

Frequently occurring concepts for dyads with a low conversation orientation.

	Rank	Concept	Relative Count*
Protective	1	Think	34.2
	2	Time	15
	3	Mum	14.6
	4	Talk	11.6
	5	Health	11.2
	6	Breast	10.7
	7	Cancer	10.0
	8	Suppose	6.8
Laissez-faire	1	Think	34.6
	2	Mum	12.9
	3	Time	10.8
	4	Talk	9.8
	5	Guess	8.2
	6	Kids	7.2
	7	Health	6.4
	8	Life	5.5

*Relative count is a percentage indicating the number of times the concept co-occurs with the tag (i.e. “protective” or “laissez-faire”) relative to the number of times the concept occurs in all the text.

Table 6.9

Frequently occurring concepts for dyads with a high conversation orientation.

	Rank	Concept	Relative Count*
Pluralistic	1	Think	45.3
	2	Mum	18.0
	3	Time	17.9
	4	Daughter	14.0
	5	Should	9.5
	6	People	9.0
	7	Cancer	8.8
	8	Work	8.8
Consensual	1	Think	42.1
	2	Mum	15.9
	3	Time	10.4
	4	People	9.8
	5	Talk	9.2
	6	Guess	8.0
	7	Friends	7.0
	8	Cancer	6.6

*Relative count is a percentage indicating the number of times the concept co-occurs with the tag (i.e. “pluralistic” or “consensual”) relative to the number of times the concept occurs in all the text.

6.11 Discussion

Study 1B sought to address three research questions:

1. What is the nature of the downward and upward health communication patterns within mother-daughter dyads, particularly with regard to mammography?
2. Are there differences in communication as reported by mothers compared to daughters?
3. Are there differences in communication between dyads of different FCP types?

The results that pertain to each of these research questions will be discussed in turn.

6.11.1 Downward and Upward Communication

As mothers and their daughters reflected on their communication patterns and tendencies, it became evident that both downward and upward communication about health occurred within the dyads. This evidence of two-way exchanges of information and influence between mothers and their adult daughters is consistent with previous research by Fingerman (2001). Fingerman's mother-daughter interviews indicated that as daughters become adults their role expands, resulting in mother-daughter interactions that are not dissimilar to those that would be observed between peers. However, some consistent differences in the nature of downward (as compared to upward) communication were observable in the current study, suggesting that there are some persistent role-specific factors that influence family communication patterns between mothers and their adult daughters.

Mothers perceived their attempts at influencing their daughters on topics such as sexual health, mental health, exercise, and nutrition were subtle, and often referred to asking questions, making suggestions, or planting seeds. Similar to this finding, Boone and Lefkowitz (2007) observed that mothers were far more likely to ask questions than to lecture or point out negative consequences when discussing sexual health, drugs and alcohol, and exercise and nutrition with their offspring. However, in stark contrast to the mothers' perceptions, daughters in the current study perceived their mothers' downward communication as directive and at times commanding. This result is consistent with the findings of Study 1A which demonstrated that mothers tend to perceive the communication patterns within the dyad as more conversation-orientated than daughters do, while daughters perceive communication with their mothers to be more conformity-

oriented. Further, Baker, Whisman, Kelley, and Brownell (2000) reported similar discrepancies in perceptions of discussions about nutrition and body weight between mother and daughter. These discrepancies may reflect defensiveness on the daughters' behalf at receiving input from their mothers in relation to personal and sensitive topics. Indeed, it was frequently reported by participants in the current study that daughters were initially unreceptive to discussing topics relating to sexual health.

Despite this, there was much evidence from the current study for mothers positively influencing their daughters' health attitudes and behaviour across a range of topics. This finding is also consistent with other work, with previous researchers demonstrating that mother-daughter communication about sex in particular has been successful in positively influencing the daughter's health behaviour (e.g., Hutchinson, 2002; Hutchinson et al., 2003). Overall, it was clear that downward family communication was characteristic within the mother-daughter dyads interviewed for this study, and mothers' attempts to influence their daughters' health behaviour were generally successful.

Downward parent-child health communication has been the almost exclusive focus of previous research about the impact of family communication on health attitudes and behaviours (as highlighted by Mosavel, 2009; Steinberg, 2001). The current study is one of just a few attempts made in recent years to examine whether upward family communication about health is evident between parent and child, and whether such communication influences the parent in some way. More specifically, the current study examined the presence/absence of upward communication about health within mother-daughter dyads, and explored whether this communication influenced the mother's health attitudes and behaviours. Indeed, the results of the current study indicate that upward communication was a normal part of mother-daughter interactions. Daughters frequently initiated conversations about healthy lifestyle choices such as exercise, dietary changes, and quitting smoking, consistent with previous work (e.g., Mosavel et al., 2006; Patten et al., 2004).

Daughters were likely to be directive, blunt, and even bossy in their attempts at communication and influence, and consequently mothers were not always receptive to their daughters' attempts. Upward health communication was generally only successful if the mothers received their daughters' attempts positively. Mosavel (2009) reported a similar finding: mothers who perceived that their adolescent daughters were trying to

give advice, rather than simply share ideas and opinions, were less likely to see their daughters as credible sources of health information. In a related study by Mosavel and Thomas (2009), adolescent daughters reported attempting to influence their mothers with regard to fashion, contraceptives, dieting, quitting smoking, and cancer screening using highly directive communication strategies. These tendencies may reflect the daughters' limited repertoire of communication strategies to employ when trying to assist or influence another person, which would presumably develop with age and experience. However unlike the studies conducted by Mosavel (2009) and Mosavel and Thomas (2009), daughters who participated in the current study were adults, making this explanation less likely. In addition, Washington et al.'s (2009) mother-daughter communication study was also conducted with adult daughters, and still there was evidence of daughters using primarily directive communication strategies to advise and influence their mothers. Therefore it is perhaps more likely that mothers are more invested than their daughters in maintaining a positive and open relationship and consequently they employ less risky and more passive communication techniques (Fingerman, 2001), and may be more thoughtful in their approach to advice-giving.

In sum, upward communication about health was a normal feature of mother-daughter communication for the dyads that participated in this study. While daughters demonstrated that they were willing and able to initiate such communication, their attempts at influencing their mother's behaviour were not always successful, probably because of the forward and directive communication strategies they employed. The implication may be that daughters need to develop more amenable communication strategies in order to increase the likelihood that their attempts at influence will be received positively by their mothers, and will therefore be successful in facilitating positive health behaviour change.

6.11.2 Mammography Communication

Mammography communication between mothers and their daughters in this study was primarily in the downward direction, and even then conversations were often trivial, such as the mother mentioning an upcoming mammography clinic appointment, or a recent mammogram. Note however that previous research has shown that even a brief conversation about mammography can have an impact on the conversation partner (Fox & Stein, 1991), so these reported discussions are not inconsequential. Daughters

only initiated a conversation about mammography if they were experiencing breast health problems and were seeking their mother's advice or support. Upward communication about mammography for the purposes of positively influencing the mother did not occur spontaneously within dyads in this sample. Neither mothers nor daughters indicated that mothers spontaneously offered breast health advice, however mothers appeared to deliver firm advice in the instance that a daughter had a breast health concern. In a related vein, Sinicrope et al. (2009) surveyed a large number of adult daughters ($N = 2328$) about breast cancer risk reduction advice they had received from their mothers. Just 9% of women reported having ever received such advice from their mothers. However, of those that had received such advice, 89% had acted upon it. These statistics suggest that while spontaneous interpersonal communication about mammography between family members is not exceptionally common, it is effective if it does occur.

Both mothers and daughters were more likely to consider the possible benefits to the daughter rather than to the mother in having a conversation about mammography. The frequency with which both mother and daughter participants considered the daughters' breast health needs above the mothers' was somewhat surprising, given that none of the daughters in the current study were of screening age as defined by BreastScreen Australia. It may be that in this instance the traditional mother and daughter roles prevailed, with the mother being inclined to attend first to her daughter's needs, while the daughter was primarily concerned for herself and expected her mother to be also.

Though not the most frequently mentioned response, it was still evident that some participants considered the benefits that upward family communication about mammography could have for the mother, with more than a quarter of all responses reflecting this idea. Note that these responses were offered by participants spontaneously, without any prompting from the interviewer to specifically consider the effects of upward family communication about mammography. This is an encouraging result, as it suggests a readiness and a willingness amongst daughters to utilise upward family communication as a means of promoting mammography to target women, and also reflects a receptiveness amongst mothers to receiving these messages.

Although communication about mammography for the purposes of positively influencing the mother did not occur spontaneously within dyads in this sample, it

seems they would not feel hindered in doing so if prompted. Despite their discussion of possible barriers, there was a distinct sense from both mothers and daughters that a conversation about mammography should not be an especially difficult conversation to have. Many thought that while barriers were possible, it was unlikely that they themselves, or their daughters, would actually experience them. Note that most participants reported previous (albeit brief) discussions about mammography, which may have served to reduce the perceived difficulty of the conversation.

6.11.3 Communication Patterns by Role

A computerised conceptual and relational analysis was conducted on the transcripts using Leximancer in order to determine if there were any marked differences in the speech of mothers compared to daughters as recorded in the interviews. Possible role-related differences in the topics discussed in the interviews were of interest because they may indicate concern with particular issues or topics, or relative ease in discussing the topic.

On the whole, mothers' and daughters' reports of their communication contained the same frequently occurring concepts. That is, for the most part mothers and daughters conversed about communication with one another using similar language. There was one noteworthy exception to the conceptual consistency observed in mothers' and daughters' speech: mothers were more likely to discuss breast cancer, while daughters were more likely to discuss a range of health issues. This difference emerged in spite of the fact that the same interview schedule was used for both groups. Silk et al. (2006) similarly found that mothers were significantly more likely to discuss breast cancer in focus groups than their adolescent daughters who participated in separate, but identically structured, focus groups. Recall that mother participants in the current study were all of screening age as defined by BreastScreen Australia, while their daughters were not. Thus this result probably reflects the fact that the older women perceived greater susceptibility to breast cancer due to their age, and thus it was a more relevant concern for them. The implication of this finding is that daughters seem not to converse (or recall conversing) about breast cancer or mammography spontaneously, which is consistent with the findings discussed in Section 6.11.2. However as discussed in Section 6.11.1, upward health communication can have a positive impact on the mother's health behaviour. Thus it is evident that while there is potential for upward

communication to have a positive impact on the mothers' mammography attitudes and behaviours, daughters need to be prompted to initiate such communication.

6.11.4 Communication Patterns by Type

A computerised conceptual and relational analysis was conducted on the transcripts using Leximancer in order to determine if there were any differences in the speech of participants from different dyad types. The procedure outlined in Section 6.7.4.2 resulted in each dyad being classified as one of the four FCP types: pluralistic, consensual, laissez-faire, and protective. It was anticipated that high conversation orientation dyads (i.e. pluralistic and consensual dyads) would be more likely to engage in open, bi-directional conversation than dyads low on the conversation orientation (i.e. protective and laissez-faire dyads). This expectation was supported by the data. The speech of participants from high conversation orientation dyads during the interviews had numerous frequently occurring concepts. This result indicates that as mothers and daughters from these dyads discussed their communication with one another during the interview, they frequently mentioned a wider range of topics than low conversation orientation dyads, which is consistent with more open and unrestricted communication. In contrast, participants from dyads low on the conversation orientation had fewer frequently mentioned concepts in their speech, perhaps suggesting less homogeneity in responses of this group.

Of particular relevance to the aims of this research project is the finding that mothers and daughters with a high conversation orientation were more likely to use the word "should" when discussing communication with one another. This was usually spoken in the context of a participant describing an instance where they had advised their mother or daughter that they "should" do something differently, or an instance where they recalled having been told such from their mother/daughter. As such, this finding provides evidence of both upward and downward communication and influence within pluralistic and consensual dyads. Similarly, prior work based on the FCP as applied to political discussions also found that high conversation-oriented families were more likely to evidence upward communication about politics than low conversation-oriented families (Saphir & Chaffee, 2002). Future research exploring the nature of the relationship between mothers and daughters with a high conversation orientation may

highlight additional features of the relationship (e.g. a sense of responsibility) that contribute to this finding.

The primary purpose of this analysis was to examine any differences in reported communication between dyads high and low on the conversation orientation, with the findings indicating that there were observable differences. In contrast, high and low conformity orientation dyads were not distinct from one another in terms of their reported communication. Previous FCP researchers (e.g., Koerner & Cvacara, 2002) similarly reported that the relationship between the conformity orientation and communication outcomes was more difficult to predict and identify.

As a final comment, note that the modified RFCP scale was utilised in this study to classify mother-daughter dyads into types. That this novel instrument classified dyads into types that had observable communication differences in line with theoretical predictions is indicative of its validity and utility.

6.11.5 Limitations

The primary limitation of Study 1B is the small convenience sample. Participants were volunteers from the community and thus did not necessarily represent a cross-section of the broader population of mothers and adult daughters. Women who responded to recruitment materials may have a closer relationship and more open communication with their mother/daughter and/or be more aware of health issues than the general population, thus being more willing to participate in this particular study.

Further, the data obtained in this study are merely descriptive. Descriptive research conducted on a restricted sample has limited external validity. While the data are useful in informing and shaping future research, they cannot be used to draw conclusions about the population at large.

6.11.6 Conclusions

The results of this qualitative interview study suggest that future work using an upward family communication strategy to promote mammography to target women may be viable. Upward communication about health was a normal part of interactions between mothers and their daughters in this sample, particularly those who were conversation-oriented. This finding has theoretical significance, as it is consistent with predictions derived from the FCP theory. Although mammography was not a topic

frequently initiated by daughters, there was a demonstrated awareness that mothers could benefit from such a conversation. It appears that mammography is not a topic of conversation that daughters spontaneously initiate, and they may need assistance to successfully and effectively initiate such a conversation.

6.12 Final Remarks

The studies reported in this chapter have their roots in predictions derived from FCP theory. FCP theory postulates that both downward *and* upward communication may exist within a family, with the likelihood of open, two-way exchanges occurring between parent and offspring increasing with the extent to which the family is conversation-oriented. These ideas fuelled the development of the concept of using upward family communication as a strategy to promote mammography to target women. Study 1A trialled a modified version of the RFCP tailored for mother-daughter dyads, and results indicated that these modifications did not compromise the internal consistency of the instrument.

Study 1B served to validate both the theoretical and conceptual underpinnings of the current research project. Firstly, Study 1B provided evidence for differences in reported communication patterns between dyads that were high and low on the conversation orientation as measured by the modified RFCP instrument, lending support to the predictions of FCP theory. Few published studies have examined differences in communication patterns in line with the FCP predictions, and no previous work has done so within the context of health. Secondly, the findings of Study 1B lend support to the notion that an upward family communication strategy would be a viable means of promoting mammography to target women, although note that such communication is unlikely to occur spontaneously. In response to this finding, two interventions designed to prompt daughters to initiate upward family communication about mammography were trialled, and the results are presented in Chapters 7 and 8.

7 Study 2: An Implementation Intention Intervention to Facilitate Upward Family Communication about Mammography

7.1 Introduction

The results of Study 1B suggest that young women are both willing and able to communicate with and influence their mothers about health issues. This means that harnessing upward family communication between mothers and daughters could be a viable mode of preventive health promotion to the older generation of women. This chapter reports on a two-stage study which was designed to further assess the viability of using upward family communication to promote mammography to target women, and to trial the use of implementation intentions (IIs) to increase young women's participation in this promotion strategy.

This pilot intervention had three broad aims. The first aim was to use the Theory of Planned Behaviour (TPB) as a theoretical basis for understanding the antecedents and predictors of the desired behaviour. Upward family communication about mammography is a novel application of the TPB, and thus it was considered important to assess the utility of the variables in this model in predicting the desired behaviour. The theory posits that both intention and perceived behavioural control (under certain conditions) are independent predictors of the target behaviour, while attitude, subjective norm, and perceived behavioural control predict levels of intention to perform the behaviour (Ajzen, 1991). The current study tested these predictions with regard to upward family communication about mammography. Similarly, the current study explored other possible predictors that have been shown to impact health behaviour (e.g., past behaviour and key demographic variables, see Ajzen, 1991; 2002) in order to better understand the antecedents of the desired behaviour, which has not been investigated in this context previously.

Secondly, this study aimed to supplement the TPB with the use of IIs, which have been successfully used to increase the rate of performance of a range of health behaviours such as cervical cancer screening (Sheeran & Orbell, 2000), testicular self-examination (Steadman & Quine, 2004), and breast self-examination (Orbell et al.,

1997). Sections 5.4 – 5.7 presented a more detailed discussion of the TPB model and the utility of IIs as a supplementary strategy. The formation of an II involves specifying an action plan. IIs then act volitionally, converting a pre-existing intention into behaviour by transferring control of the behaviour to the environmental cues specified in the action plan, which when encountered should (somewhat automatically) trigger the desired behaviour (Brandstatter, et al., 2001; Gollwitzer, 1993, 1999). In reference to the TPB model, IIs are proposed to operate post-intentionally (between intention and behaviour) as represented in Figure 5.6. Thus, for the present study, it was hypothesised that participants who formed IIs would be more likely to perform the desired behaviour, and those with a high level of intention would be more susceptible to the effects of IIs.

The final and most important aim of this study was to explore the viability of an upward family communication intervention to promote mammography. The methods used in this study were designed to build on the findings of Study 1B by empirically testing young women's willingness and ability to initiate a conversation with their mothers about mammography, and by recording the outcomes of this conversation. The desired effects of the upward family communication are that the mother will be positively influenced towards mammography in knowledge, attitude, intention, and ultimately behaviour. Due to practical limitations that prevented direct follow-up with the participants' mothers, the young women were asked to report on any changes they perceived in their mothers' attitudes or behaviour as a result of initiating a conversation about mammography with them. If the younger women perceived no effect, or indeed negative effects from the conversation, this would cast doubt on the viability of this approach to mammography promotion. Thus, it was important to measure perceived outcomes to ensure that the conversations initiated by the younger women were achieving the desired ends.

7.2 Method

7.2.1 Participants

Female undergraduate students between the ages of 18 and 39 years ($M = 20;09$) were recruited for participation in this two-stage study. This particular age range was selected because the participants were not of screening age themselves, but they were likely to have an older female family member in the age range for which regular screening is recommended (50 – 69 years, though women aged 40 – 49 and 70+ may

also attend for free screening mammography). Psychology undergraduates participated for course credit. Participants from other faculties were recruited by promoting the study in large undergraduate lectures, and advertising on campus using fliers and posters. Small incentives (coffee vouchers or \$5 department store gift cards) were offered to non-psychology students in exchange for participation.

A 14% attrition rate was observed between Stage One ($N = 135$) and Stage Two ($N = 116$). Analysis of demographics and baseline TPB data revealed no significant differences on any variable between participants who returned for participation in Stage Two and those who did not [$F(1,133)$ values from .06 – 3.35, all $p > .05$], nor did the attrition affect one condition disproportionately to the other. Thus, participants without a full data set were excluded from the analyses. The remainder of this chapter refers exclusively to the final sample of $N = 116$, which consisted of 60 control participants and 56 participants in the experimental condition.

7.2.2 Materials

7.2.2.1 Stage One Questionnaire

This questionnaire began with a brief information paragraph about breast cancer and mammography, highlighting age as the greatest risk factor for developing breast cancer, and outlining the benefits of regular screening mammography. Following this, participants were asked if they had ever discussed mammography with an older female family member in the past. The term “older female family member” was used throughout the questionnaire to allow for the possibility that young women have discussed, or would consider discussing, mammography with a relative other than their mother (e.g., grandmother).

The same questionnaire booklet also included 15 items to assess TPB variables in relation to initiating a conversation about mammography with an older female family member in the near future. Based on Ajzen and Fishbein’s (1980) recommendations, attitude, perceived behavioural control, subjective norm and intention were measured using items with a seven-point Likert scale. The questionnaire was designed so that the 15 TPB items were randomised, and the positions of the positive and negative anchors were counterbalanced.

The measurement of an attitude attempts to capture a person’s general evaluative feeling towards the behaviour. In this questionnaire, attitude was assessed with five

items that used the stem “For me to initiate a conversation about mammography with an older female family member is/would be...” and responses were required on five different scales (*extremely harmful-extremely beneficial*, *very unimportant-very important*, *very desirable-very undesirable*, *extremely worthwhile-extremely worthless*, *very foolish-very wise*). Reliability was satisfactory ($\alpha = .75$), and the possible range of scores was 5 - 35. Similarly, perceived behavioural control was measured by six items ($\alpha = .84$, possible range of scores 6 - 42), which asked participants to rate their confidence (*very confident-very unconfident*), perceived ease of initiating the conversation (*very easy-very difficult*), and control (*outside my control-within my control*). Three additional behavioural control items, “I feel capable of initiating a conversation about mammography with an older female family member”, “If I wanted to, I could easily initiate a conversation with an older female family member about mammography within the next 2 months”, and “I am discouraged from initiating a conversation about mammography with an older female family member because I’m unsure how to raise the topic” required a response on a *strongly disagree-strongly agree* scale.

Three items were used to assess intention ($\alpha = .88$, possible range of scores 3 - 21). Participants responded to the statements, “I will try to have a conversation about mammography with an older female family member in the next 2 months” (*definitely true-definitely false*), “I plan to have a conversation about mammography with an older female family member in the next 2 months” (*very unlikely-very likely*), and “I intend to initiate a conversation with an older female family member about mammography within the next 2 months” (*very unlikely-very likely*).

A single item was used to measure subjective norm, as recommended by Ajzen and Fishbein (1980); “Most people whose opinions I value would approve of me talking to an older female family member about mammography” (*definitely true-definitely false*).

The following paragraph appeared at the end of the questions, and concluded this task for control participants:

It is important for young women to discuss mammography with female family members who are in the ‘at risk’ age group (over 50 years old). It is important because it helps raise awareness

about breast cancer screening: both its availability and its benefits. Over the next 2 months or so, you may consider discussing mammography with an older female family member.

Participants allocated to the experimental group were exposed to an additional paragraph and task, which was the II intervention:

You are more likely to initiate a conversation about mammography with an older female family member if you decide when, where, and how this might take place, and with whom. Write these decisions down in the space provided below.

Participants in the experimental group were then guided to form an II by asking them to specify (by writing in the space provided) *who* they would initiate the conversation with, *when* and *where* the conversation would take place, and *how* they would begin the conversation. Control and experimental versions of this questionnaire appear in Appendix C.

7.2.2.2 Demographics Form

Participants completed a short form specifying demographic details of interest such as their age, student status, marital status, income, and family history of breast cancer.

7.2.2.3 Stage Two Questionnaire

This questionnaire was designed to determine whether participants engaged in the desired behaviour after participating in Stage One, and to gather information about their experiences in doing so. The questionnaire asked students to report whether or not they initiated a conversation about mammography with an older female family member and, if so, who the family member was (e.g., mother, aunt). Participants who did have a conversation were also asked to indicate their perceived outcomes of the conversation, and could select as many as were applicable from a list of nine potential outcomes, as well as add their own observations if they wished. All participants (regardless of whether or not they engaged in the desired behaviour) were asked to comment on any

factors they perceived would have made initiating the conversation easier, and any perceived barriers or difficulties. Intention was re-assessed with the same three items used in the Stage One questionnaire, to ensure that the II intervention acted upon volition, rather than simply increasing levels of intent (Milne et al., 2002). See Appendix D for a copy of the Stage Two questionnaire.

7.2.3 Procedure

For Stage One, participants were tested in a classroom setting with groups of up to 10. Random allocation of each testing session to either the experimental condition (exposed to the II intervention) or control condition (information only) served to ensure that all participants in the classroom were engaged in identical tasks. Information and consent forms were distributed and collected prior to the commencement of the research activities.

Participants were instructed to generate a unique participant code (using the six numbers of their date of birth, followed by the first three letters of their mother's maiden name), and to use this as a marker on the questionnaires and demographics form. Participants were then directed to work through the questionnaire booklet at their own pace.

The participants' final task was to complete the demographic details form, and on a separate page provide their email address to allow the researcher to contact the participant regarding Stage Two of the study. Participants were simply told that Stage Two would consist of another questionnaire on a related topic, thus reducing the likelihood of experimenter demand effects. Stage One took 40-50 minutes to complete, depending on the assigned condition.

Data collection for Stage Two occurred approximately eight weeks after Stage One in a small group setting (to allow adequate time for daughters who did not reside with their mothers to engage in the target behaviour), with a maximum of four participants at a time. Participants completed the follow-up questionnaire, and upon completion were debriefed about the nature of the study, and were provided with two copies of a brochure issued by BreastScreen NSW (a subsidiary of BreastScreen Australia) outlining breast cancer risk factors and information about screening mammography. Participants were encouraged to keep one copy for themselves, and pass on the second copy to their conversation partner, or if they did not initiate a

conversation about mammography, to pass the brochure onto a female family member in the target age range for regular screening. Stage Two took approximately 10 minutes to complete.

7.3 Results

7.3.1 Descriptives and Randomisation Check

Most participants were single, full time university students with no family history of breast cancer (see Table 7.1). Preliminary analyses on demographic and baseline variables were performed to ensure that the experimental and control groups were equivalent at Stage One. Categorical variables were subject to Chi Squared analyses to examine if there were any differences between conditions. As can be seen in Table 7.1, condition was not significantly associated with any of the categorical demographic variables. TPB variables and participant age were subject to ANOVAs (see Table 7.2), which indicated that the only variable that was significantly different between conditions was age, with participants in the control group being significantly older than the experimental group. However, the difference in mean age between groups was just 20 months, with both the control and experimental groups having mean ages typical of undergraduate students. Thus this cohort difference, while statistically significant, is unlikely to have influenced the experimental manipulation. These results suggest that pre-intervention, the groups were equivalent with regard to their motivation to engage in the desired behaviour, their performance of the target behaviour in the past, and most key demographic variables. Note in particular that participants' mean intention scores indicate that after being provided with some basic information about mammography, the level of intention at Stage One was not significantly different between conditions.

Table 7.1

Demographic variables by condition.

		Frequency Counts		χ^2	<i>df</i>	<i>p</i>
Demographic variables		Experimental <i>N</i> = 56	Control <i>N</i> = 60			
Previous behaviour*	Yes	33	31	.77	2	.68
	No	22	27			
Family history	Yes	16	17	.16	2	.92
	No	33	34			
	Unsure	9	7			
Student status	Full-time	55	55	2.53	1	.11
	Part-time	1	5			
Marital status	Single	53	48	6.72	3	.08
	Married/Defacto	2	8			
	Divorced/Separated	0	3			
	Other	1	1			
Household income	<\$20,000	11	8	6.55	4	.16
	\$20 – 50,000	4	13			
	\$50 – 80,000	16	17			
	\$80 – 100,000	12	7			
	>\$100,000	13	14			

* Refers to previous discussions about mammography with an older female family member.

Table 7.2

Continuous variables at baseline by condition.

Baseline variables	Experimental		Control		<i>F</i> (1, 114)	<i>p</i>
	<i>N</i> = 56		<i>N</i> = 60			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Attitude	25.68	3.90	24.83	4.36	1.21	.28
Subjective norm	5.91	1.58	6.22	1.38	1.24	.27
Perceived behavioural control	35.48	6.83	34.70	6.52	.40	.53
Intention	12.39	4.44	11.50	4.62	1.13	.29
Participant age	19.92	3.31	21.57	5.13	4.21	.04

7.3.2 Utility of the TPB Model

The relationships between the TPB variables were assessed using Pearson correlations collapsed across conditions, with results displayed in Table 7.3. These results indicate that, with the exception of subjective norm, TPB variables were correlated in a theoretically consistent manner.

Table 7.3

Pearson correlations between Theory of Planned Behaviour variables.

	1.	2.	3.	4.
1. Attitude	—			
2. Subjective norm	.06	—		
3. Perceived behavioural control	.34**	.12	—	
4. Intention	.52**	-.09	.34**	—

** $p < .01$ (two-tailed).

Attitude, subjective norm and perceived behavioural control were regressed on intention, and together were found to significantly predict levels of intention, $F(3,112) = 17.71$, $p = .00$, $r^2 = .30$. As can be seen in Table 7.4, both attitude and perceived

behavioural control were significant independent predictors of intention. Subjective norm did not independently predict intention.

Table 7.4

Attitude, subjective norm and perceived behavioural control regressed on intention.

TPB Variable	Standardised β	t	p
Attitude	.46	5.60	.00
Subjective norm	-.14	-1.75	.08
Perceived behavioural control	.20	2.39	.02

7.3.3 Predicting Behaviour

The desired behavioural outcome for this intervention was the successful initiation of a conversation about mammography with an older female family member. Fifty participants (43%, 30 of which were from the experimental group) reported having initiated the desired behaviour, and almost all of these participants (94%) reported having had the conversation with their mothers.

As this target behaviour is novel, it is important to explore what variables, or combination of variables, can predict this behaviour. To address this issue, a backward logistic regression was performed, with the binary dependent variable being whether or not the young women initiated a conversation about mammography with an older female family member. Independent variables were selected for inclusion in the logistic regression if a univariate analysis returned a result of $p < .25$ (see Hosmer and Lemeshow, 1989). The results of the univariate analyses presented in Tables 7.5 and 7.6 demonstrate that the demographic variables of household income, student status, and family history of breast cancer were not likely candidates for contributing to the prediction of the desired behaviour, and thus were not included in the multivariate analysis. Similarly, subjective norm was excluded from the logistic regression analysis on the basis of the univariate results.

Note in particular the result that family history of breast cancer was not associated with initiating a conversation about mammography. Other work has found that a family history of breast cancer is associated with increased perceived risk and

compliance with preventive recommendations (e.g., Gross, Filardo, Singh, Freedman, & Farrell, 2006; Keinan-Boker, Baron-Epel, Garty, & Green, 2007; Sabatino et al., 2004) but the findings from this study did not align with this pattern.

The backward regression procedure excluded variables from the logistic model based on the likelihood ratio, with past behaviour, attitude, and marital status all being removed at subsequent steps of the analyses. The resulting model from each step was not a significantly better fit than the preceding model (all $p > .05$), though the final logistic model was significantly better at predicting the dependent variable (67% of cases correctly classified, $r^2 = .18$) than a constant-only model, [59% of cases correctly classified, $\chi^2(5) = 26.27, p = .00$] and thus there is no disadvantage in retaining the more parsimonious, final model. Beta scores, odds ratios, and p values for the predictor variables included in the final logistic model are displayed in Table 7.7.

Table 7.5

Univariate analyses of the relationship between each categorical IV with the DV.

Variable	χ^2	<i>df</i>	<i>p</i>
Condition	4.84	1	.03
Previous behaviour	7.52	2	.02
Family history	1.37	2	.50†
Student status	.25	1	.62†
Marital status	4.97	3	.17
Income	3.00	4	.56†

†excluded from subsequent multivariate analyses based on p value cut-off of .25

Table 7.6

Univariate analyses of the relationship between each continuous IV with the DV.

Variable	<i>F</i>	<i>p</i>
Age	3.53	.06
Attitude	6.71	.01
Subjective norm	.69	.41†
Perceived behavioural control	15.38	.00
Intention	9.65	.00

†excluded from subsequent multivariate analyses based on p value cut-off of .25

Table 7.7

Predictor variables in the final logistic model.

Predictor Variable	β	Exp(β)	p
Age	.01	1.00	.12
Condition	-.81	.44	.05
Perceived behavioural control	-.11	.89	.00
Intention	-.09	.91	.06

Perceived behavioural control was a strong independent predictor of whether the participant initiated upward family communication about mammography, and intention approached significance as an independent predictor. These results are consistent with the TPB framework, however traditionally it is expected that intention is the strongest predictor of behaviour. Condition also emerged as a (marginally) significant independent predictor, meaning that those who formed IIs were more likely to have initiated upward family communication about mammography. This gives some indication that the intervention was successful overall. Age of the participant made no independent contribution to the prediction of the desired behaviour, which was as expected (see Section 7.3.1).

7.3.4 II Intervention Effects

While the above analyses reveal that condition was a significant, independent predictor of whether the participant initiated upward family communication about mammography, a more rigorous way to test the effects of the intervention is to look at the frequency data of behavioural performance by condition. A Chi Squared analysis was performed on this data, which indicated that significantly more women in the experimental group (54%, $n = 30$) initiated a conversation about mammography with an older female family member, as compared to control participants (33%, $n = 20$), $\chi^2(1) = 4.84$, $p = .03$. These results indicate that those who formed IIs were more likely to perform the desired behaviour.

However, this analysis does not evaluate the mechanism by which IIs are proposed to operate: that is, increasing the conversion of intention into behaviour. For the II to operate volitionally, an intention has to be present in the first place. Therefore, to test whether the IIs formed in this study increased the conversion of intention to behaviour, a separate analysis must be run for those who reported a higher level of

intention at baseline. To identify participants who were intenders at Stage One, a median split was performed on the data by intention score, with those scoring above the median intention score (12) at Stage One being classified as intenders (range = 13-21), and those with a score of 12 or below as non-intenders (range = 3-12). Table 7.8 displays descriptive statistics for the intender and non-intender groups, as well as the frequency data, which outlines the proportion of participants from each intender group and from each condition, that engaged in the desired behaviour.

Table 7.8

Descriptives and outcomes by condition and intention group.

Intention Group		Condition	
Intenders		Experimental	Control
	<i>N</i>	26	27
	<i>M</i>	16.19	15.52
	<i>SD</i>	2.50	2.33
Proportion of participants who initiated conversation		62%	52%
Non-Intenders		Experimental	Control
	<i>N</i>	30	33
	<i>M</i>	9.10	8.21
	<i>SD</i>	2.80	3.18
Proportion of participants who initiated conversation		47%	18%

Mean intention scores were significantly different between the intender and non-intender groups [$F(1, 114) = 197.34, p = .00$], and there were no differences in intention scores between conditions within either the intender [$F(1,51) = 1.03, p = .31$] or non-intender [$F(1, 61) = 1.37, p = .25$] groups.

Two separate Chi Squared tests were performed, one on each intender group, with condition and behavioural performance (yes/no) being the categorical variables. The results of these analyses indicated that although there was a trend for intenders who formed IIs to be more likely than control group intenders to initiate the desired behaviour (62% versus 52%), this relationship was not significant, $\chi^2(1) = .51, p = .48$.

However, significantly more non-intenders who formed IIs had a conversation, as compared to non-intender controls (47% versus 18%), $\chi^2(1) = 5.88, p = .02$, suggesting that the intervention did not necessarily operate by converting existing intentions into behaviour, but in fact was more successful for those who reported a lower baseline level of intention.

One possible explanation for this could be that participating in the II intervention simply increased the level of intention from baseline, and therefore those classed as non-intenders at baseline actually became intenders after forming IIs. If this were the case, it would indicate that the II intervention did not operate volitionally as expected, but motivationally, simply increasing the level of intention for those with a low baseline score, and the elevated level of intention then facilitated behavioural performance. If this process occurred, we would expect participants who formed IIs to experience a greater increase in intention scores between Stages One and Two as compared to controls. A 2 (condition) x 2 (intention scores at Stages One and Two) x 2 (intender or non-intender at Stage 1) mixed-design ANOVA demonstrated that overall intention scores rose significantly between Stages One ($M = 12.00$) and Two ($M = 13.77$), $F(1,111) = 16.80, p = .00$, and that the intention x intender group effect was significant, meaning that changes in intention between stages were different for the two intender groups, $F(1,111) = 47.21, p = .00$. While those classified as non-intenders at Stage 1 (intention score $M = 8.63$) reported significantly higher intention levels at Stage 2 ($M = 12.89, p = .00$), intenders experienced a marginally significant drop in intention scores between Stages One ($M = 15.85$) and Two ($M = 14.79, p = .05$), however even at Stage Two their mean intention scores were significantly higher than those of the non-intender group ($MD = 1.9, p = .01$). This suggests that participation in the study alone increased levels of intention to initiate upward family communication about mammography for those who originally reported low levels of intention, and this occurred regardless of condition, with the intention x intender group x condition [$F(1,111) = .17$] and the intention x condition [$F(1,111) = .02$] interactions being non-significant (all $p > .05$). The main effect of condition was also non-significant, $F(1,111) = 2.13, p = .15$.

A final analysis of the effects of the II intervention was conducted by examining subgroups of women based on their behavioural control beliefs (i.e. their perceived behavioural control scores). There were two reasons for conducting this analysis.

Firstly, perceived behavioural control emerged as the strongest predictor of behaviour in the current study, and this result suggests that further analysis of this variable is warranted. Secondly, Rutter, Quine, Steadman, and Thompson (2007) have set a precedent for such an analysis, with their results suggesting that an II intervention worked best for women who initially had low perceived behavioural control with regard to attending an appointment for mammography. Thus, the intervention effects of the current study were examined for those with relatively high and low scores on this variable. A median split (median score = 37) was performed to divide the sample into those who reported a higher level of perceived control over the target behaviour, and those who reported lower perceived behavioural control. The overall mean perceived behavioural control score was high ($M = 35.49$ out of a possible 42), and thus the two groups will be referred to as ‘higher perceived behavioural control’ (range = 38-42) and ‘lower perceived behavioural control’ (range = 14-37). The mean perceived behavioural control scores were significantly different between the two groups, $F(1,114) = 173.02, p = .00$ (see Table 7.9).

Based on a Chi Squared analysis of the full sample, 62% of participants with higher perceived behavioural control initiated upward family communication about mammography, compared to just 26% of participants with lower perceived behavioural control, $\chi^2(1) = 14.94, p = .00$. Separate Chi Squared analyses were also performed on each of the two perceived behavioural control groups, with conversation and condition as the categorical variables. Within the lower perceived behavioural control group, participants in the experimental condition were no more likely to have initiated upward family communication about mammography than control participants [24% of control participants versus 30% of experimental participants, $\chi^2(1) = .29, p = .59$], a result that is inconsistent with Rutter et al.’s (2007) findings. However, within the higher perceived behavioural group, experimental participants were more likely to have initiated the desired conversation, with 76% of experimental participants having successfully performed the behaviour as compared to 46% of control participants, $\chi^2(1) = 5.13, p = .02$. Thus, the II intervention was most successful for participants who reported a higher level of perceived behavioural control at Stage One.

Table 7.9

Descriptives and outcomes by condition and PBC group.

PBC Group		Condition	
Higher PBC		Experimental	Control
	<i>N</i>	29	26
	<i>M</i>	40.69	40.27
	<i>SD</i>	1.49	1.46
Proportion of participants who initiated conversation		76%	46%
Lower PBC		Experimental	Control
	<i>N</i>	27	34
	<i>M</i>	28.89	30.44
	<i>SD</i>	5.78	5.58
Proportion of participants who initiated conversation		30%	24%

7.3.5 Perceived Outcomes of Conversation

Participants who reported at Stage Two that they did initiate a conversation with an older female family member about mammography were asked to consider what the outcomes of the conversation were, if any. Participants could endorse as many of the nine possible outcomes (both positive and negative) as were relevant to them, and could also add their own observations. Of the 50 participants who reported having initiated upward family communication about mammography, 43 (86%) indicated that they perceived at least one positive outcome. As can be seen from the frequency data displayed in Table 7.10, three of the listed outcomes were endorsed far more frequently than the others. The top two responses were outcomes that could be described as self-focussed: the participants frequently reported beneficial outcomes to themselves. The third highest response, “My older female family member is now more likely to have a mammogram”, is more reflective of the aims of the study, and this perceived outcome could be described as other-focussed. Note that within the “other” response category,

there were two reports of mothers being reminded they were due for a mammogram as a result of their daughter initiating a conversation about mammography, and another of a mother booking in for a mammogram as a direct result of the conversation.

Table 7.10

Perceived outcomes of the conversation by condition.

Perceived Outcome	Frequency		
	Experimental	Control	Total
I am now more likely to seek out information about mammography	14	10	24
I am now more aware about the importance of mammography	14	6	20
My older female family member is now more likely to have a mammogram	7	9	16
No consequences or outcome	6	2	8
Other	3	5	8
My older female family member is now more aware of the importance of mammography	1	6	7
I am now more aware of the disadvantages of mammography	5	2	7
My female family member is now more likely to seek out information about mammography	4	3	7
My older female family member is now more aware of the disadvantages of mammography	0	0	0
My older female family member has had a mammogram as a result of our discussion	4	0	4
My older female family member is now less likely to have a mammogram	0	0	0
Total	58	43	

It is interesting to consider the patterns of reported outcomes between conditions. Experimental participants reported a higher number of positive outcomes than control participants. Note in particular that each of the participants who reported that their older female family member had undergone mammography as a result of the conversation was from the experimental group. Making a plan by forming an II may assist young women in initiating an effectual conversation.

7.3.6 Facilitators and Barriers

For the purposes of planning future interventions and research, all participants (regardless of whether they had performed the desired behaviour) were asked to indicate what could have made initiating a conversation about mammography easier, and any barriers that had made it difficult, or indeed prevented the initiation of the conversation.

Responses were coded and categorised independently by the author, and an additional coder who was unaware of the study's hypotheses. There was an 85% agreement rate between the two coders, and discrepancies were resolved through discussion. Some clear themes emerged from participants' responses as they considered possible facilitators of the desired behaviour. Each predominant facilitator that was identified is explained below:

External initiator or prompt: The perceived need for an external initiator or a prompt was a strong and consistent theme, with 37.5% of all responses reflecting this notion. In particular, young women identified media images or stories, brochures, health professionals, and family friends who had experience with breast cancer or breast screening as potentially helpful conversations starters or reminders:

“If there was info on it like an ad on T.V. or something so I could lead on from there”. (270888SHE, control)

“Perhaps if my mother and I had heard of someone being involved with a particular illness, or if we viewed something on TV in relation to mammography”. (230388JOR, experimental)

More information: Young women also consistently reported that being better informed about mammography would have made initiating the conversation easier, particularly if some persuasion was necessary:

“If I had more information about the benefits”. (010785URB *control*)

“It would have been easier if I had known more about mammograms”.
(251088ROB, *experimental*)

Timing or environmental factors: Participants tended to indicate that less busy schedules, the absence of other people, especially male family members, and a more comfortable environment conducive to conversation would have made it easier to find an appropriate time to initiate a conversation about mammography with their older female relative.

“A better situation to bring it up in and more time to talk seriously about it”.
(080289EVA, *control*)

“Not being so busy”. (140782BOO, *experimental*)

Relationship factors: Younger women spoke of the importance of a closer relationship with their older female family member in order to make initiating the conversation easier. This closeness was referred to in terms of both proximity and intimacy. Note that 67% of responses indicative of this theme came from control participants:

“If the family member lived close by and I spoke with her face to face at regular intervals”. (261166SIN, *control*)

“A better, more open relationship”. (100985MEN, *control*)

Other, more minor themes that emerged as participants considered potential facilitators of the conversation were the presence of a family history of breast cancer, and having a greater perceived relevance of the topic.

Of those who successfully initiated upward family communication about mammography, 66% of them reported there were no barriers to doing so. Of these, most (67%) were from the experimental group. In comparison, only 36% of participants who did not initiate upward family communication about mammography reported an absence of barriers. In these instances, participants were largely indicating they “just forgot”, rather than any real or perceived barrier preventing the enacting of the behaviour.

For the most part, the barriers that were identified did not reflect novel themes, but instead described a lack of things previously identified as facilitators. However, one noteworthy result was that almost 20% of responses referred to the sensitive or private nature of the conversation topic as a barrier. This theme may mirror the comments participants gave about a more intimate relationship with the target relative being a facilitator.

7.4 Discussion

The aims of this study were (1) to apply the TPB to a novel behaviour in order to explore predictors of this novel behaviour, so as to better understand how to predict and explain behavioural performance, (2) to trial an II intervention with the aim of increasing the conversion of intention into behavioural performance, and (3) to begin to determine the efficacy and viability of an upward family communication strategy to promote mammography to target women. The results pertaining to each of these aims will be discussed in turn.

7.4.1 Utility of TPB

The results of the current study add to an already substantial body of research that supports the TPB (Armitage & Conner 2000, 2001; Conner & Sparks, 1996; Godin & Kok, 1996). Attitude, perceived behavioural control, and intention were all significantly correlated with one another. Subjective norm failed to correlate significantly with any other TPB variable. With the exception of subjective norm, the relationships between variables were consistent with those posited by the TPB model. Likewise, although a model with attitude, subjective norm, and perceived behavioural control entered as predictor variables accounted for 30 percent of the variance in intention, only attitude and perceived behavioural control were significant independent predictors of intention scores. These results are consistent with findings from a meta-

analytic review of 185 TPB studies, which found that subjective norm is often a weak predictor of intention, and therefore behaviour, perhaps because of the common single-item method of measuring this variable (Armitage & Conner, 2001). However, several studies that have employed multiple-item scales to measure subjective norm have still failed to demonstrate a significant relationship between this variable and intention or behaviour (e.g., Bozionelos & Bennett, 1999; Brickell et al., 2006). Armitage and Conner (2001) suggest that future work give attention to empirical measurement of subjective norm, and also to the different types of normative pressure (e.g., descriptive, moral) that behaviour may be subject to.

While these are possible explanations for the subjective norm results in this study, a more pragmatic explanation may be favoured. It is likely that the behaviour targeted in the current study was so novel that participants had not given the issue of upward family communication much consideration prior to participation in the study, and thus found it hard to conceptualise how significant others would evaluate the behaviour. Indeed participant data lends some support to this explanation. Participants' intention scores were not particularly strong at Stage One (mean and median of 12, out of a possible 21), and at Stage Two when participants were asked to report on facilitators and barriers to the behaviour, many participants responded with "none", accompanied by a concession that it was simply not something they thought of doing. These results suggest that more groundwork may be necessary with young women in order to increase their level of engagement with the issue, and raise their level of baseline intention.

7.4.2 Predicting Behaviour

Overall, the findings of the current study add to the substantial evidence that the TPB has utility in predicting health-related and communication behaviour (e.g., Barsevick et al., 2008; Hyde & White, 2009) and provide new evidence that the TPB is useful for predicting upward family communication about mammography. It was hypothesised that the TPB variables taken together as a model would predict behaviour, and that perceived behavioural control and intention would also independently predict behaviour. If the TPB variables were effective in predicting behaviour as an aggregate model, we would expect that the logistic model would retain all variables as predictors. However, on the basis of inadequate likelihood ratios and univariate results

respectively, attitude and subjective norm were excluded from the analysis and did not appear in the final logistic model. This indicates that these variables were not contributing to the prediction of whether participants initiated upward family communication about mammography. However, perceived behavioural control and intention were both retained in the model, and perceived behavioural control was a significant independent predictor of behaviour, while the contribution of intention approached significance. Participants who reported a higher level of perceived control over the desired behaviour were significantly more likely to perform the behaviour than those who reported lower perceived behavioural control.

It is consistent with the TPB that intention and perceived behavioural control would predict behaviour, whereas attitude and subjective norm would not directly or independently explain variance in the behaviour. This pattern of relationships between variables has also been found in relation to other health behaviours (e.g., physical activity and quitting smoking, Conner & Godin, 2007).

Ajzen (1991) addresses the issue of relative importance of intentions and perceived behavioural control in predicting behaviour and, in doing so, advises that in situations where *actual* volitional control over the behaviour is reduced, *perceived* behavioural control is likely to emerge as a stronger predictor relative to intention. Volitional control may be reduced when successful performance of the behaviour is not wholly dependent on the actor, and relies on other external variables. Indeed, the successful performance of the target behaviour in the current study was not reliant on the participant alone, but also on factors such as spending time with an older female relative within the timeframe dictated by the study and the relative's openness to participating in a conversation about mammography, as reflected in participant responses in Stage Two. Therefore, even young women with the best of intentions to initiate upward family communication about mammography may be prevented from doing so by external factors. Previously, IIs have been used to facilitate performance of behaviours that are wholly or predominantly reliant upon one's own decision-making such as studying (Sheeran, Webb, & Gollwitzer, 2005), eating fruit and vegetables (Armitage, 2006), and quitting smoking (Armitage, 2007). These behaviours do not fundamentally require the participation or cooperation of another person in the way that everyday health communication does. It is therefore possible that the effectiveness of

IIs is reduced when intention is not the primary predictor of behaviour, and when other factors (or other people) hinder one's ability to implement an action plan.

The high mean score of perceived behavioural control reported by participants at Stage One suggests that the younger women either did not anticipate barriers they subsequently reported in Stage Two, or believed they would be more successful in overcoming these barriers than they actually were. These factors may explain why perceived behavioural control was a stronger predictor of behaviour than intention in this study.

Finally, it was hypothesised that condition would predict behavioural performance, as those who formed IIs should be more likely to enact the desired behaviour. Condition was retained as a predictor in the final logistic model, and was shown to independently predict behaviour. This result indicates that those who formed IIs were more likely to initiate a conversation about mammography with an older female family member, which is preliminary evidence for the success of using IIs to increase performance of this behaviour.

The age of the participant also contributed (though not independently) to the prediction of whether they initiated upward family communication about mammography. Results suggested that the older the participant, the more likely they would be to engage in the target behaviour. This may reflect a pattern that older participants have older mothers, and therefore the participants' mothers were more likely to be of screening age. Alternatively, more mature participants may have been more engaged in the process. Note however that while these age-related results were statistically significant, they may not reflect real-world age differences because the sample used in this study was relatively homogenous (primarily of young adult women, mostly single, full time university students).

While no specific hypotheses were made, previous behaviour and key demographic variables were also explored as predictors of behaviour. No demographic variables were retained in the final logistic model, nor was previous behaviour, indicating that they did not contribute to the prediction of whether or not participants successfully initiated a conversation about mammography. Based on the findings of previous research (e.g., Gross et al., 2006; Keinan-Boker et al., 2007; Sabatino et al., 2004), it may have been expected that a positive family history of breast cancer would be associated with the young woman initiating a conversation about mammography, but

our results were not consistent with this pattern. Young women in our study who reported a family history of breast cancer were no more likely than those without a family history to have initiated a conversation about mammography with an older female family member. This may be because the desired behaviour in this study was not a preventive behaviour for self, and therefore any increased perceived risk that may result from a positive family history did not directly impact on the behaviour being measured.

7.4.3 II Intervention

Using IIs as a behaviour change technique involves forming action plans that specify situational cues that will prompt the target behaviour when encountered. The II intervention presented in this chapter was successful overall, with significantly more young women having initiated a conversation with an older female relative if they formed IIs. Forming plans about when, where, and how the conversation would be initiated increased the likelihood that the conversation would actually take place, a result that adds to the evidence of the utility of IIs in assisting behaviour change (e.g., Brandstatter et al., 2001).

Take for example a young woman who formed an II by specifying she would initiate a conversation about mammography with her mother, after dinner when tidying the kitchen, by saying “Mum, I learnt about mammograms at uni this week. Have you ever had a mammogram?”. According to the proposition, once the specified situational cues are encountered, the behaviour should be enacted with some level of automaticity, in a manner that mimics habit (Gollwitzer, 1999; Orbell et al., 1997). Assuming the same level of intention to perform the behaviour, the young woman who forms this II will be more likely to perform the target behaviour than another young woman who has not formed an II, because the desired behaviour will be elicited once the specified cues (with mother, after dinner, tidying the kitchen) are encountered. The pattern of results in the current study lends some support to this prediction, as those who formed IIs were more likely to enact the desired behaviour, although whether the participants performed the behaviour in the context of the specified environmental cues was not assessed here. Previous research has demonstrated a high degree of agreement between the plans made and behavioural performance (e.g., Brandstatter et al., 2001).

However, Gollwitzer (1993) specified that IIs operate volitionally, meaning they are effective because they translate intention into behaviour, not merely because they increase intention levels. This mechanism presupposes the presence of intention, and explains that IIs work by converting this intention into behavioural performance, thereby producing an implementation intention by goal intention interaction effect. This proposition has been empirically supported, as IIs have been shown to be most effective for people with a high level of intention for a variety of behaviours such as studying (Sheeran et al., 2005), fruit and vegetable intake (Armitage, 2006), and quitting smoking (Armitage, 2007). In spite of this well-established trend, the results of the current study did not follow this pattern. Participants who reported baseline levels of intention that fell below, or were equivalent to the median score (non-intenders) were more likely to be susceptible to the effect of IIs than those with an intention score above the median (intenders). In fact, within the current study, the II intervention did not work for intenders. Within this group, those who formed IIs were no more likely to initiate the desired behaviour than controls, though there was a trend in the anticipated direction. In contrast, 80 percent of non-intenders who reported having initiated the desired conversation had formed IIs. Amongst non-intenders, those who formed IIs were significantly more likely to have initiated a conversation about mammography than controls, indicating that the intervention was more successful for those who reported lower levels of intention to perform the behaviour at baseline.

One possible explanation for this unexpected result is that in the current study, IIs operated motivationally (by raising levels of intention) and not volitionally (by converting intention into behaviour). However, this explanation is rendered implausible through the analysis of intention scores between Stages One and Two. While overall intention scores rose between Stages One and Two, and non-intenders experienced a rise in intention levels between stages, these effects did not differ between experimental groups. Previous published work has likewise established that IIs do not increase one's motivation to perform the behaviour (e.g., Orbell et al., 1997; Sheeran et al., 2005; Steadman & Quine, 2004).

Another potential explanation for the result is that it is a reflection of ceiling effects in the intender group. That is, perhaps high intenders had such high intention scores that behavioural performance was inevitable. Again, analysis of the intention scores permits the refutation of this possibility. Those classed as intenders had a mean

intention score of 15.85 (out of a possible 21), and 57 percent of intenders performed the desired behaviour. It is unlikely these modest figures are indicative of ceiling effects. Thus, neither motivational nor ceiling effects can account for the unusual pattern of experimental effects observed in this study.

It is important to note however that while the effect of IIs for non-intenders is not a theoretically consistent result, it is not unprecedented. In an earlier study by Rutter, Steadman, and Field (2002), the effect of implementation intentions in facilitating mammography screening was also only significant for the group with lower initial intention scores. Subsequent work by this research group explored perceived behavioural control as an important variable in determining the effectiveness of II interventions (Rutter et al., 2006; Rutter et al., 2007), and the results of the current study highlighted the strength of the relationships between perceived behavioural control and behavioural performance. Consistent with the results of Rutter et al.'s (2007) II study that aimed to increase mammography screening, the effects of the II intervention presented in this chapter varied with perceived behavioural control scores. However, in contrast to Rutter et al.'s findings, the current intervention worked best for those who reported higher perceived behavioural control at Stage One. Instead, Rutter et al.'s results indicated that their II intervention worked best for women with low perceived behavioural control pre-intervention. Further, they measured both intention and perceived behavioural control at Stage Two, which revealed that while IIs did not increase intention to attend a mammography appointment, IIs did facilitate an increase in perceived behavioural control. Rutter et al. conclude that in their study, IIs operated motivationally by strengthening behavioural control beliefs, and not motivationally as expected. The current study only measured intention at Stage Two and not perceived behavioural control, and thus data are not available to perform a similar analysis here. However, the results of the current study suggest that IIs strengthened the relationship between perceived behavioural control and behavioural performance. When taken with Rutter et al.'s results, the current findings suggest that future research should give further attention to the relationship between IIs and perceived behavioural control.

It is worth mentioning that the fact that the II intervention worked best for those with a low level of intention actually highlights the strength and utility of IIs as it can facilitate performance of the target behaviour even for those not already engaged with a particular issue. Similarly, Armitage's (2006) work with IIs and the Transtheoretical

Model also underscored the strength of IIs, as he demonstrated they could be used to move people forward from the pre-contemplation stage to the contemplation stage with regards to reducing dietary fat intake. Armitage explains that although people's intention scores may be low, their intentions to perform the target behaviour may actually be neutral, and therefore susceptible to influence, rather than a reflection that they intend *not* to perform the behaviour. Given that the target behaviour in the current study is rather novel, it is plausible to assume that lower intention scores may be largely reflective of neutral, and therefore malleable, intentions.

The results of this study provide modest evidence of the effectiveness of IIs in increasing the likelihood that young women would initiate upward family communication about mammography. However, IIs did not operate volitionally, and contrary to expectations, perceived behavioural control emerged as the strongest predictor of behaviour. Given these findings, a motivational intervention that aims to strengthen behavioural intentions and highlight control over the target behaviour is worthy of exploration as a potential strategy to facilitate upward family communication about mammography.

7.4.4 Viability of an Upward Family Communication Approach to Mammography Promotion

The current study aimed to harness the potential influence of young women on their older female relatives by way of prompting them to engage in upward family communication about mammography, and influence their older female family members to have, or consider having, a mammogram. This approach was met with modest success. In spite of only intermediate initial intention levels, young women demonstrated willingness and an ability to initiate a conversation about mammography with their mothers, with good outcomes. Some 43 percent of participants successfully initiated the desired conversation and, of these, 86 percent reported at least one positive outcome. The two highest frequency responses were self-focussed, with the participants indicating knowledge-related benefits for themselves. With a mean participant age of 20 years, it is perhaps not surprising that their concerns were for themselves first and foremost, despite the study being framed in a manner that emphasised the screening needs of the older generation. Participants were fully debriefed with thorough information about mammography and recommended screening ages, so it is unlikely

that the study prompted screening behaviour at an inappropriate age. These results do indicate that participants who successfully initiated a conversation about mammography found the process to be positive, beneficial, and perhaps even interesting, highlighting the viability of using young women as vehicles for health communication within their families.

The other high frequency response was more in line with the aims of the intervention. With less than 60 percent of target women participating in regular mammographic screening, the primary motivation for trialling an upward family communication intervention was to influence more target women to have mammograms. Although no behavioural data for the older female family members are available from this study, many young women perceived that post-conversation, their older female relatives were more likely to have a mammogram. This suggests that not only was the conversation well-received by the older female family member, but that it seemed to have the desired effect with regard to impacting target women's beliefs and attitudes towards mammography.

Even more encouraging are the four reports of mothers actually having had a mammogram in the intervening time between Stages One and Two, and at least one other who had booked in for a mammogram, all reportedly as a result of the conversation initiated by their daughters. Despite not having any baseline data about the mothers (e.g., intention to screen), and not being able to validate the participants' perceptions (e.g., it is possible some participants falsely attributed the screening behaviour to the conversation they initiated, when in fact there could have been other prompts), it is certainly a noteworthy trend. These results are conceptually significant as they demonstrate that positive outcomes were evident in a short period of time as a result of participants initiating upward family communication about mammography. Washington et al. (2009) posit that one mechanism through which the influence of daughters on their mothers may operate is the impact of the upward communication on subjective norms. They argue that daughters are likely to be referents for their mother's subjective norm evaluations. Thus, the daughter's initiation of a positive conversation about mammography may demonstrate to mothers that at least one important person in their life would support a decision to adhere to mammography screening guidelines, and therefore increase the mother's perception of positive subjective norms. The assessment of this possible mechanism of upward communication and influence is beyond the

scope of the current study, but it does represent an interesting avenue for future research.

An unanticipated effect of the II intervention was that young women who formed IIs reported more positive outcomes of the conversation. While control participants still reported numerous positive outcomes, they did so with a reduced frequency, and indicated that the outcomes were more modest. Of particular interest is that only participants from the experimental group reported that their older female family member had undergone mammography as a result of the conversation. While not measured in the current study, it is possible that forming an II assisted young women to plan to engage in a more complex, comprehensive, and effectual conversation.

Despite the clear indications that the young women were willing and able to initiate a conversation about mammography with positive outcomes, participants were also clear that this was not necessarily an easy task to do on their own. Many participants, both those who did and did not have the desired conversation, reported that initiating the conversation would have been easier to do if there was an external initiator or prompt that made the conversation more pertinent or relevant. Participants felt that initiating a conversation about mammography was somewhat contrived. Upward family communication about mammography is a novel behaviour, and probably not one that the participants had given significant thought to prior to participation in the study, thus their concerns about it being artificial are understandable. Further, despite efforts to avoid explicitly informing participants that they would need to report on whether or not they performed the desired behaviour at Stage Two, for many there was probably some level of awareness of the nature of the follow-up stage. This may have served to create some experimenter demand effects, and prompt behavioural performance within the intervening time between stages, rather than allowing the participants to await a more natural time to begin the conversation. Given so many participants specified that an external prompt would have been a facilitator of the conversation, future work in this area could look at specifically encouraging the younger women to look out for opportunities or prompts to begin a conversation about mammography, such as an advertisement about a breast cancer fundraiser, or an acquaintance being diagnosed with cancer.

Participants also frequently commented that having more information about mammography would have made having the conversation easier. In this study,

participants were given only very brief, introductory information about breast cancer and mammography, but clearly their interests were peaked and consequently more information to equip them for a more in-depth conversation is a strategy to consider in subsequent work in this area. Thorough training of the participants was outside the scope of this investigation, given it was a trial study and somewhat exploratory in nature.

Intuitively, the success of an upward family communication intervention relies on the existence of a functional relationship between members of the younger and older generations, and participant self-report provides supporting data for this assumption. Proximity to, and intimacy with, their mothers was another variable that participants identified as a facilitator. However, almost all responses of this nature came from control participants. The identification of these relationship factors as facilitator is mirrored by reports that a level of awkwardness surrounded a conversation topic as private or as sensitive as mammography. Presumably, these concerns are less significant within a close and open mother-daughter relationship. This notion is consistent with the findings of Study 1B, which identified conversation-oriented dyads as most likely to be engaging in bi-directional conversations about health.

While considerable attention has been given to the discussion of what could have been done to make initiating the conversation easier, and the identification of barriers to doing so, it is important to remember that for those who successfully initiated the desired conversation, 66 percent reported that there were no barriers to enacting this behaviour. In addition, most (67 percent) of the participants who reported a complete absence of barriers were from the experimental group. While we can only speculate on the basis of available data, it is possible that forming IIs helped participants to overcome any attitudes, beliefs, or feelings that could act as barriers to initiating the conversation, resulting in increased self-efficacy, or perceived behavioural control. Indeed, Achziger, Gollwitzer, and Sheeran, (2008) suggest that IIs serve to shield goals from any unwanted interference from negative influences or barriers. In the current study, those in the control group may not have been shielded from the interference of attitudinal, relational, or knowledge-related barriers, and therefore they were more likely to report on these issues at follow-up. Alternatively, it is possible that experimental and control groups were equivalent in terms of their perception of possible barriers before having the conversation, but in performing the behaviour the barriers

were effectively overcome, and were thus less salient by the time participants were asked to report on them at follow-up. This would explain why there were more reported barriers for both participants who did not initiate a conversation, and control participants (who were generally less likely to initiate the desired conversation).

7.4.5 Limitations and Future Directions

While this study has made significant contributions, it is bound by some methodological limitations. Being limited in access to the younger women (participants) only, it was not possible to conduct behavioural follow-up with their conversation partners (mostly their mothers). The primary motivation for trialling an upward family communication intervention was to influence more target women to have mammograms, as the national screening rate currently sits at less than 60 percent of target women. Therefore it would have been interesting to have baseline data from the older female family members that measured their mammography awareness, previous screening behaviour, attitudes and beliefs towards the behaviour, and also to conduct a follow-up at three months post-conversation to obtain self-report data about any changes in these variables, or indeed changes in screening behaviour. Inclusion of the conversation partner in the study should be a vital part of more comprehensive research in the future.

Additionally, this study did not measure participants' behaviour in light of the individual IIs they formed. Participants were not specifically asked to report on the circumstances surrounding the conversation they initiated with an older female family member at Stage Two. This eliminated the possibility of systematically testing the notion that the cues specified in the II triggered or elicited the desired behaviour once encountered. A small number of participants supplied this information spontaneously, but the sample was too small to readily enable any analyses to be conducted.

Further, as requested by the participants themselves, it seems that extra training of the younger women is required for them to feel sufficiently confident and able to initiate a positive and productive conversation about mammography with an older female family member. This may be particularly pertinent given that perceived behavioural control was the strongest predictor of behavioural performance. Future studies need to provide more information to participants at baseline, which should have

the spin-off effect of increasing their perception that the behaviour is under volitional control, as they will not be limited by inadequate knowledge.

7.4.6 Conclusions

Notwithstanding the limitations outlined above, the current study has made substantial contributions to the understanding of upward family communication as a mammography promotion strategy. This study utilised IIs with the aim of prompting young women to engage in upward family communication about mammography. The intervention succeeded in increasing performance of the desired behaviour, however the II intervention worked best for those with lower baseline levels of intention, and with high baseline behavioural control beliefs.

This trial study demonstrated that upward family communication about mammography is a viable avenue through which to promote screening to target women. This method of mammography promotion deserves further research attention. The current study used the TPB framework for predicting and explaining behavioural performance, and provides preliminary evidence that the TPB has good utility as applied to this novel behaviour. Chapter 8 presents a study that aimed to give further weight to these findings, and also to evaluate a motivational intervention that used CFT with the aim of facilitating upward family communication about mammography.

8 Study 3: A Counterfactual Thinking Intervention to Facilitate Upward Family Communication About Mammography

8.1 Introduction

The previous chapter reported the results of Study 2, which indicated that upward family communication about mammography was a viable approach to promoting mammography to target women. Study 2 also demonstrated the utility of the TPB in predicting this target behaviour. Further, some evidence was provided for the success of a volitional intervention (using IIs) to prompt young women to initiate a conversation about mammography with an older female family member. In light of the finding that the II intervention did not operate volitionally, an exploration of a motivational intervention is warranted.

While much previous work has demonstrated the predictive power of the TPB with regard to health behaviours (see Ajzen, 1991; Conner & Armitage, 2001 for reviews), there is less evidence for the efficacy of motivational interventions that target TPB variables with the aim of facilitating behaviour change (e.g., Beale & Manstead, 1991; Parker et al., 1996; Sheeran & Silverman, 2003). A common limitation of such motivational interventions is the use of passive strategies that do not ensure participant engagement, such as the provision of written or verbal information. The current chapter reports on Study 3, a two-stage study that trialled CFT as a novel motivational strategy that required active involvement from participants. This motivational intervention aimed to facilitate upward family communication about mammography. It was expected that CFT would produce a behavioural effect by boosting motivation to perform the target behaviour.

As discussed in detail in Section 5.2.6.5, CFT may influence behaviour via either the content-neutral or the content-specific pathway (Epstude & Roese, 2008), with the latter being the focus of the current study. The content-specific pathway illustrates how CFT may operate as a motivational strategy within the TPB framework by facilitating the formation of a behavioural intention (Smallman & Roese, 2009). CFT requires making a causal inference that identifies a goal-directed behaviour that will

bring about the desired outcome. For example, the identification of a causal behaviour (e.g., “If I had shown my mother the article I read about mammography, then she might have had a mammogram”) and the subsequent formation of a behavioural intention (e.g., “I will show my mother the information I have about mammography”) should increase behavioural performance (Epstude & Roese, 2008; Smallman & Roese, 2009).

It was expected that in this study, CFT would operate motivationally by strengthening behavioural intention to perform the target behaviour. While the pathway through which this effect might occur was not manipulated or assessed in the current study, there are two main reasons for expecting counterfactuals to impact behaviour in this way. First, Epstude and Roese (2008) argue that the content-specific pathway is the default route through which CFT influences behaviour if the counterfactuals are upward, additive thoughts. Such counterfactuals are often automatically generated following a negative event, as they hold the most functional benefit when an undesired outcome is reached. Participants in the current study were specifically instructed to generate upward counterfactual thoughts about a hypothetical situation in which an inaction resulted in a negative outcome. Given the task was designed in such a way as to elicit upward, additive counterfactuals, it was expected that the default content-specific pathway would be activated, and that this would result in performance of the behavioural intention in the future. Second, Smallman and Roese’s (2009) experimental evidence suggests that such CFT automatically activates the related behavioural intention, and does not result in a general motivational boost to perform any just behaviour associated with the goal, but only that behaviour that is identified in the behavioural intention. This finding is consistent with the activation of the content-specific pathway.

The aims of the two-stage study reported in this chapter were threefold. Firstly, the current study sought to replicate the results of Study 2 to provide further evidence that the TPB has utility in predicting upward family communication about mammography, and to identify other possible predictors of the target behaviour.

Secondly, this study trialled a CFT intervention that attempted to facilitate upward family communication about mammography by strengthening intention to initiate upward family communication about mammography. It was hypothesised that the formation of counterfactual thoughts in response to one of two negative-outcome

vignettes would increase the likelihood that young women would initiate upward family communication about mammography as a result of strengthened intentions.

Finally, this study aimed to provide additional evidence for the viability of an upward family communication intervention to promote mammography, based on the assessment of participant experiences and self-reported outcomes. Based on the results of Study 1B and Study 2, it was expected that young women would demonstrate both a willingness and an ability to engage their older female family members in a positive and productive discussion about mammography.

8.2 Method

8.2.1 Participants

Female staff and students (98 percent of participants were students) from the University of Wollongong between the ages of 18 and 39 years ($M = 21.06$) were recruited for participation in this two-stage study. As with Study 2, this age range was selected because the participants were not of screening age themselves, but they were likely to have an older female family member in the age range for which regular screening is recommended (50 – 69 years, though women 40 – 49 and 70+ may also attend for free screening mammography). Women were only eligible to participate in this study if they had not participated in any previous studies relating to this project. Psychology undergraduates participated for course credit. Additional participants (undergraduates from other faculties, and general staff members of the university) were recruited by promoting the study in large lectures, and by posting fliers and posters around campus. Small incentives (coffee vouchers or \$5 department store gift cards) were offered to these additional participants in exchange for participation. The sample used for Study 3 was independent of Study 2's sample.

An 18 percent attrition rate was observed between Stage One ($N = 159$) and Stage Two ($N = 131$), which did not affect one condition disproportionately to the other ($\chi^2 = .19$, $p = .67$). Analysis of demographics and baseline TPB data revealed no significant differences on any variable between participants who returned for participation in Stage Two and those who did not [$F(1,157)$ values from 1.12 – 2.86, all $p > .05$], with the exception of subjective norm scores, for which the returning group ($M = 6.30$) scored significantly higher than the non-returning group [$M = 5.75$, $F(1,157) = 5.16$, $p = .02$]. However, given subjective norm was measured using only one item, this

statistical difference may not represent an actual cohort difference. Participants without a full data set were excluded from the analyses. The remainder of this chapter refers exclusively to the final sample of $N = 131$, which consisted of 62 participants in the control condition, and 69 in the experimental condition (see Section 8.2.3).

8.2.2 Materials

8.2.2.1 Stage One Questionnaire

As in Study 2, this questionnaire began with a brief information paragraph about breast cancer and mammography, highlighting age as the greatest risk factor for developing breast cancer, and outlining the benefits of regular screening mammography. Following this, the questionnaire asked participants to report whether or not they had ever discussed mammography in the past with an older female family member. Once again, the terminology “older female family member” was used throughout the questionnaire to allow for the possibility that participants had previously had, or planned to have, a conversation about mammography with someone other than their mother. Based on the findings from Study 2, it was expected however that mothers would be the primary conversation partners.

The same questionnaire booklet also included 15 items to assess TPB variables in relation to initiating a conversation about mammography with an older female family member, which were identical to the TPB items used in Study 2. Five items assessed attitude towards performing the desired behaviour (Cronbach’s $\alpha = .84$), six assessed perceived behavioural control (Cronbach’s $\alpha = .81$), three assessed intention (Cronbach’s $\alpha = .90$), and a single item was used to measure subjective norm, as recommended by Ajzen and Fishbein (1980).

As in Study 2, the following paragraph appeared at the end of the questions and concluded this task for control participants:

It is important for young women to discuss mammography with female family members who are in the ‘at risk’ age group (over 50 years old). It is important because it helps raise awareness about breast cancer screening: both its availability and its benefits. Over the next 2 months, you may consider discussing mammography with an older female family member.

Participants allocated to the experimental group were exposed to an additional activity, which was the CFT intervention. Participants in the experimental group were presented with one of two fictitious vignettes (alternate participants received the same vignette), both of which portrayed a young woman who failed to communicate with her mother about mammography, and the mother was later diagnosed with advanced breast cancer. Two vignettes depicting young women in different stages of life were used so that the materials were relevant for women from the whole target age range (18-39 years). In each of the scenarios, the negative outcome was designed to prompt upward, additive counterfactual thoughts, as these counterfactuals offer the most functional benefit (see Section 5.2.6.5). Further, the vignettes were designed to reflect the barriers that were identified by participants in Study 2. Scenario One involved a female undergraduate university student and her mother, and read as follows:

When she was a first year university student, Grace learned about the importance of regular mammography for women over 50 in a lecture. She wondered whether or not her 53-year-old mother had regular mammograms. But whenever Grace and her mum were talking at home, Grace never brought it up in conversation as she felt it would be awkward to ask about that sort of thing. She also didn't want to cause her mother to worry. However, recently Grace's mother has been diagnosed with Stage 2 breast cancer. After finding out about her mother's diagnosis, Grace had a lot of thoughts about things she could have done differently. "If only..."

Scenario Two involved a slightly older, professional woman and her mother, and read as follows:

Joanna recently read an interview with a breast cancer survivor in a women's health magazine. The survivor was 64 years old, about the same age as Joanna's own mother. The magazine article said that for women of this age, routine mammography is

the best way to find breast cancer early, and therefore increase the chances of survival, just as the woman interviewed had done. After reading this, Joanna considered ringing her own mother to find out if she had regular mammograms. But Joanna decided against calling her mother. She didn't feel like she knew enough about mammography or breast cancer to discuss it, and besides there wasn't any history of breast cancer in their family. Some time later, Joanna's mother was diagnosed with advanced breast cancer that could be life threatening. After finding out about her mother's diagnosis, Joanna had a lot of thoughts about things she could have done differently. "If only..."

Both scenarios ended with the string:

If you were Grace [Joanna], what "if only..." thoughts would be going through your mind? Write down as many as you can think of.

Participants were given five "If only..." stems to complete, plus additional space to record further upward counterfactual thoughts if they wished. In asking participants to write down their counterfactual thoughts in response to the vignette, their active involvement in this motivational technique was ensured. See Appendix E for control and experimental versions of the Stage One questionnaire.

8.2.2.2 Demographics Form

Participants completed a short form specifying demographic details of interest such as their age, student status, marital status, income, and family history of breast cancer.

8.2.2.3 Stage Two Questionnaire

This questionnaire was administered at Stage Two, approximately eight weeks after Stage One. The questionnaire asked participants to report whether or not they initiated a conversation about mammography with an older female family member, and

if so, who the family member was (e.g., mother, aunt). Participants who did have a conversation were also asked to indicate their perceived outcomes of the conversation, and could select as many as were applicable from a list of nine possible outcomes, as well as add their own observations if they wished. All participants (regardless of whether or not they engaged in the desired behaviour) were asked to comment on any factors they perceived would have made initiating the conversation easier, and any perceived barriers or difficulties. Intention was re-assessed with the same three items used in the Stage One questionnaire, to determine whether the intervention operated motivationally. The Stage Two questionnaire in this study was identical to that administered in Study 2, which can be seen in Appendix D.

8.2.3 Procedure

Participation in Stage One took place in a small group setting, in groups of up to four. Each group was randomly assigned to either the experimental condition (exposed to the CFT intervention) or the control condition (no intervention). Randomisation of groups rather than individuals served to ensure that all participants in the room were engaged in identical tasks. Information and consent forms were distributed and collected prior to the commencement of the research activities.

Participants were instructed to generate a unique participant code using the method outlined in Study 2, and to use this as a marker on all questionnaires. Participants were then directed to work through the questionnaires at their own pace.

The participants' final task was to provide their email address to allow the researcher to contact them regarding Stage Two of the study. Participants were simply told that Stage Two would consist of another questionnaire on a related topic, thus reducing the likelihood of experimenter demand effects. Stage One took approximately 40-45 minutes to complete, depending on condition.

Data collection for Stage Two occurred approximately eight weeks after Stage One (to allow adequate time for daughters who did not reside with their mothers to engage in the target behaviour), also in a small group setting with a maximum of four participants at a time. As Stage Two was identical for both the control and experimental conditions, participants from both conditions could participate in the same session. Participants completed the follow-up questionnaire, and upon completion were debriefed about the nature of the study, and were provided with two copies of a

brochure issued by BreastScreen NSW (a subsidiary of BreastScreen Australia) outlining breast cancer risk factors and information about screening mammography. Participants were encouraged to keep one copy for themselves, and pass on the second copy to their conversation partner, or if they did not initiate a conversation about mammography, to pass the brochure onto a female family member in the target age range for regular screening. Stage Two took approximately 10 minutes to complete.

8.3 Results

8.3.1 Descriptives and Randomisation Check

As in Study 2, most participants were single, full time university students with no family history of breast cancer (refer to Table 8.1). A randomisation check was performed by testing whether the experimental and control groups were equivalent at Stage One in terms of baseline and demographic variables. Categorical variables were subject to Chi Squared analyses to examine if there were any differences between conditions (see Table 8.1). Results indicated that condition was not significantly associated with any of the categorical variables. Table 8.2 displays the results of ANOVAs conducted on Stage One TPB variable scores and age, which indicates that the groups did not differ significantly on the basis of these variables. Thus the control and experimental groups were equivalent at Stage One with regard to their motivation to engage in the desired behaviour, their performance of the target behaviour in the past, and key demographic variables, which suggests the randomisation of participants into conditions was successful. It is particularly important to note that after being provided with some basic information about mammography, the level of intention to engage in upward family communication about mammography was not significantly different between the control and experimental groups at Stage One.

Table 8.1

Demographic variables by condition.

		Frequency Counts		χ^2	<i>df</i>	<i>p</i>
Demographic variables		Experimental <i>N</i> = 69	Control <i>N</i> = 62			
Previous behaviour*	Yes	45	31	3.78	2	.15
	No	22	30			
	Unsure	2	1			
Family history	Yes	20	13	1.63	2	.44
	No	39	36			
	Unsure	10	13			
Student status	Full-time	65	57	1.15	2	.56
	Part-time	4	4			
	Non-student	0	1			
Marital status	Single	59	53	3.43	3	.33
	Married/Defacto	9	5			
	Divorced/Separated	1	2			
	Other	0	2			
Household income	<\$20,000	18	8	6.49	5	.62
	\$20 – 50,000	13	15			
	\$50 – 80,000	11	12			
	\$80 – 100,000	15	13			
	>\$100,000	10	14			
	Unsure	2	0			

* Refers to previous discussions about mammography with an older female family member.

Table 8.2

Continuous variables at baseline by condition.

	Experimental	Control		
Baseline variables	N = 69	N = 62	F (1,129)	p
Attitude	26.06	26.10	.00	.96
Subjective norm	6.22	6.39	.72	.40
Perceived behavioural control	35.72	36.42	.44	.51
Intention	12.62	12.73	.02	.90
Participant age	21.35	21.61	.09	.76

8.3.2 Utility of the TPB Model

Pearson correlations were used to assess the relationships amongst the TPB variables, collapsed across conditions. As can be seen in Table 8.3, the TPB variables were correlated in a theoretically consistent manner. Corresponding to Ajzen's (1985) theoretical model, scores on all TPB variables were significantly correlated with all other TPB variables.

Table 8.3

Pearson r correlations between Theory of Planned Behaviour variables.

	1.	2.	3.	4.
1. Attitude	—			
2. Subjective norm	.32**	—		
3. Perceived behavioural control	.32**	.51**	—	
4. Intention	.50**	.25**	.28**	—

** p<01 (two-tailed).

A regression model that included attitude, subjective norm and perceived behavioural control was found to significantly predict intention scores, $F(3,127) = 15.82$, $p = .00$, $r^2 = .27$. As can be seen in Table 8.4, only attitude was a significant independent predictor of intention.

Table 8.4

Attitude, subjective norm and perceived behavioural control regressed on intention.

TPB Variable	Standardised β	<i>t</i>	<i>p</i>
Attitude	.45	5.53	.00
Subjective norm	.05	.57	.57
Perceived behavioural control	.12	1.30	.20

8.3.4 CFT Intervention

The primary hypothesis in this study was that participants who engaged in CFT would be more likely to initiate upward family communication about mammography. Consistent with previous CFT research using breast cancer vignettes (Chan et al., 2007a, 2007b), all participants were able to produce at least one counterfactual thought in response to the vignettes. All recorded counterfactuals were upward counterfactual thoughts, which was as expected given the provision of the “If only...” stem in the experimental manipulation. Seventy-one participants, 54% ($n = 36$) from the experimental group, reported having initiated the desired conversation with an older female family member. Almost all participants (92%, $n = 33$) who successfully initiated the desired conversation did so with their mothers. Neither vignette was more effective than the other in terms of facilitating upward family communication about mammography, $\chi^2(1) = .37, p = .54$.

The results of a Chi Squared test lent no support to the hypothesis that CFT would increase the likelihood of the target behaviour being performed. Participants in the experimental group were no more likely to have performed the target behaviour than control participants, $\chi^2(1) = .24, p = .62$. Note that it is not possible that the independent contribution of the intervention was absorbed by the effects of intention and perceived behavioural control as these variables were measured prior to the intervention.

As this result was contrary to expectations, further analyses were performed to ascertain whether the expected effect only occurred when a particular type of counterfactual was generated. Page and Colby’s (2003) research found that additive counterfactuals (imagining a different outcome by mentally adding antecedents) had a significant effect on behaviour change, whereas subtractive counterfactuals (imagining a different outcome by mentally subtracting antecedents) did not. The vignettes used in the current study were designed in such a way to make upward, additive counterfactuals

most salient. Indeed the vignettes were successful in inducing this type of counterfactual, with 90% of all counterfactuals produced being additive (e.g., “If only I had discussed the importance of screening with my mother”). The remaining 10% of counterfactuals were subtractive (e.g., “If only I hadn't put off an awkward conversation that could have saved mum's life”). Additive counterfactuals were the first recorded counterfactual for 96% of experimental participants. Participants whose first recorded counterfactual was subtractive were excluded, and the Chi Squared analysis was re-run. Given the predominance of additive counterfactuals, it is no surprise that the non-significant result persisted, with participants whose first counterfactual was additive being no more likely to initiate upward family communication about mammography than controls, $\chi^2(1) = .23, p = .63$.

A second re-analysis was performed which focussed on relevant versus irrelevant counterfactuals. A counterfactual was coded as irrelevant if it mutated something other than the inaction of the younger woman that led to her failing to have a conversation with her mother about mammography (e.g., “If only people didn't get cancer or we knew how to heal it”). These counterfactuals, while not irrelevant to the topic at hand, were not relevant to the target behaviour and would not have served to produce the desired behavioural intention via the content-specific pathway. Counterfactuals were coded as relevant if they imagined an alternative scenario whereby the younger woman initiated upward family communication about mammography (e.g., “If only I had the courage to talk to her about the issues relevant to her health, she could have been diagnosed at an earlier stage”). All relevant counterfactuals were upward and additive. Relevant counterfactuals allow for the transfer of information from the counterfactual to a behavioural intention, and also identify a specific behaviour that the participant could perform in the future. The consistency in semantic content between the counterfactual and the target behavioural intention, as well as the increased specificity, increases the chances of the counterfactual influencing behaviour (Epstude & Roese, 2008). Of all the counterfactuals produced, 63% were relevant thoughts, and every participant recorded at least one relevant counterfactual thought. Further, for 87% of participants who formed counterfactuals, their first recorded counterfactual thought was a relevant one. Given the predominance of relevant counterfactuals, the data were re-analysed comparing the behavioural outcome of the control participants with experimental

participants whose first counterfactual thought was a relevant one. However, results still indicated that experimental participants who produced relevant counterfactuals first were no more likely to engage in upward family communication about mammography than control participants, $\chi^2(1) = .81, p = .37$.

Although the analyses presented here indicate that the CFT intervention was unsuccessful in producing a behavioural effect, some further analyses were conducted to explore whether a motivational effect was evident. The results of a repeated measures ANOVA indicated that while intention to initiate upward family communication increased significantly between Stage One ($M = 12.67$) and Stage Two [$M = 13.89$; $F(129,1) = 8.40, p = .00$], the intention x condition interaction was non-significant [$F(129,1) = .09, p = .76$], indicating that the CFT intervention did not increase motivation to perform the target behaviour above the effect of simply participating in the study.

8.3.5 Predicting Behaviour

As the expected CFT effect did not emerge, identification of the variables that were associated with behavioural performance is particularly important as it may help explain the absence of an experimental effect. Exploratory analyses were conducted in order to determine what variables, or combination of variables, predicted the target behaviour. A backward logistic regression was performed, with the binary dependent variable being whether or not the young women initiated a conversation about mammography with an older female family member. Independent variables were selected for inclusion in the logistic regression if a univariate analysis returned a result of $p < .25$ (see Hosmer and Lemeshow, 1989). The results of the univariate analyses presented in Tables 8.5 and 8.6 demonstrate that the demographic variables of family history, student status, and participant age were not likely candidates for contributing to the prediction of the desired behaviour in this sample, and thus were not included in the multivariate analysis. As has been reported already, condition did not predict initiation of the desired conversation, and based on this finding the condition variable was not included in the logistic regression analysis.

As in Study 2, family history of breast cancer was not associated with initiating a conversation about mammography in this sample. Other work has found that a family history of breast cancer is associated with increased perceived risk and compliance with

preventive recommendations (e.g., Gross et al., 2006; Keinan-Boker et al., 2007; Sabatino et al., 2004;) but the findings from this study did not align with this pattern.

Table 8.5

Univariate analyses of the relationship between each categorical IV with the DV.

Variable	χ^2	<i>df</i>	<i>p</i>
Condition	.24	1	.62†
Previous behaviour	4.94	2	.09
Family history	.05	2	.98†
Student status	1.27	2	.53†
Marital status	4.30	3	.23
Income	9.17	5	.10

†excluded from subsequent multivariate analyses based on *p* value cut-off of .25

Table 8.6

Univariate analyses of the relationship between each continuous IV with the DV.

Variable	<i>F</i>	<i>p</i>
Age	.45	.50†
Attitude	5.73	.02
Subjective norm	4.67	.03
Perceived behavioural control	7.62	.01
Intention	12.52	.00

†excluded from subsequent multivariate analyses based on *p* value cut-off of .25

The backward regression procedure excluded variables from the logistic model based on the likelihood ratio, with attitude, past behaviour, subjective norm, and marital status all being removed at subsequent steps of the analyses. The resulting model from each step was not a significantly better fit than the preceding model (all $p > .05$), though the final logistic model was significantly better at predicting the dependent variable (70% of cases classified correctly, $r^2 = .18$) than a constant-only model [54% of cases classified correctly, $r^2 = .23$, $\chi^2(1) = 26.22$, $p = .00$], and thus there is no disadvantage

in retaining the more parsimonious, final model. Beta scores, odds ratios, and p values for the predictor variables included in the final logistic model are displayed in Table 8.7.

Table 8.7

Predictor variables in the final logistic model.

Predictor Variable		β	$\text{Exp}(\beta)$	p
Income	<\$20,000	1.07	2.90	.51
	\$20 - 50,000	.51	1.66	.75
	\$50 – 80,000	-.53	.59	.75
	\$80 – 100,000	1.18	3.24	.47
	> \$100,000	.05	1.05	.98
Perceived behavioural control		-.07	.93	.05*
Intention		-.14	.87	.00*

* significant at $\alpha = .05$

Both perceived behavioural control and intention were independent predictors of whether the participant initiated upward family communication about mammography. Indeed, mean intention scores at Stage One were significantly higher for those who subsequently engaged in upward family communication about mammography ($M = 13.94$) compared to those who did not [$M = 11.17$, $F(1,129) = 13.03$, $p = .00$]. Similarly, participants who successfully performed the target behaviour scored significantly higher on perceived behavioural control at Stage One ($M = 37.35$) than those who did not perform the behaviour [$M = 34.52$, $F(1,129) = 7.77$, $p = .01$]. These results are consistent with the TPB framework, which proposes that intention, and under certain conditions perceived behavioural control, should independently contribute to the performance of a target behaviour. Together, the results of the univariate and multivariate analyses indicate that a participant's self-reported levels of intention and perceived behavioural control at Stage One were the best predictors of whether or not they engaged in upward family communication of mammography. These analyses suggest that exposure to the counterfactual intervention did not significantly increase the likelihood that the target behaviour would be performed, and instead the TPB variables of intention and perceived behavioural control determined behavioural performance.

8.3.6 Perceived Outcomes of Conversation

Participants who reported at Stage Two that they did initiate a conversation with an older female family member about mammography were asked to report on their perceived outcomes of the conversation. As in Study 2, participants could endorse as many of the nine possible outcomes (both positive and negative) as were relevant to them, and could also add their own observations. Of the 71 participants who reported initiating upward family communication about mammography, 66 (92%) indicated that they perceived at least one positive outcome. Table 8.8 displays frequency data for each of the nine potential outcome responses provided.

As in Study 2, participants frequently reported beneficial outcomes to themselves, such as being more aware of the importance of mammography, and being more likely to seek out information for themselves about mammography. The top two outcomes were far more frequently endorsed than any other possible response, and both can be described as self-focussed. The third most frequent response, “My older female family member is now more likely to have a mammogram”, is more reflective of the aims of the study, and this perceived outcome could be described as other-focussed. Unlike in Study 2, there were no apparent differences in reported perceived outcomes between conditions.

Table 8.8

Perceived outcomes of the conversation by condition.

Perceived Outcome	Frequency		
	Experimental	Control	Total
I am now more aware about the importance of mammography	22	24	46
I am now more likely to seek out information about mammography	22	19	41
My older female family member is now more likely to have a mammogram	11	11	21
My older female family member is now more aware of the importance of mammography	10	7	17
My female family member is now more likely to seek out information about mammography	6	7	13
Other	4	7	11
I am now more aware of the disadvantages of mammography	3	4	7
No consequences or outcome	3	2	5
My older female family member has had a mammogram as a result of our discussion	3	0	3
My older female family member is now more aware of the disadvantages of mammography	0	1	1
My older female family member is now less likely to have a mammogram	0	0	0
Total	84	82	

8.3.7 Facilitators and Barriers

All participants (regardless of whether they had performed the desired behaviour) were asked to reflect on what could have made initiating a conversation about mammography easier, and any barriers that they perceived or experienced (all participants answered each question). Responses were categorised according to the themes that emerged in Study 2 by two independent coders, with an 87% agreement rate between coders. Discrepancies were resolved through discussion. Factors that participants reported as facilitators to the discussion are dealt with in detail below:

External initiator or prompt: The most frequent response by participants was that some form of external initiator or prompt, such as a story in the media or someone they knew having breast cancer, would make initiating upward family communication about mammography easier. Thirty-two percent of all responses reflected this idea:

“Media influences e.g., news stories, friends or family showing interest or having mammograms done”. (190789MCB, *control*)

“Some form of external stimulus about mammography which could make the conversation more relevant such as a leaflet or advertisement”. (031086ROG2, *experimental*)

More information: Young women clearly felt that having a greater knowledge of issues related to breast cancer and mammography would have facilitated conversation with their older female family member:

“If I had more personal knowledge on the topic”. (250173IRV, *control*)

“If I knew more I could have made it more conversational”. (210889CHI, *experimental*)

Timing or environmental factors: Participants indicated that the absence of interruptions, a more comfortable environment conducive to conversation, or being less busy would have made it easier to find an appropriate time to initiate a conversation about mammography with their older female relative. Some participants also commented that current circumstances in their lives/homes meant that it was not an ideal time to be having these types of discussions:

“It wasn't very difficult to initiate, but did not have enough time for a proper conversation”. (010889KNI, *control*)

“Different circumstances and better communication between my mother and myself during the last 6 weeks”. (270688ZEL, *experimental*)

Relationship factors: Young women referenced the importance of closeness with their older female family member, both in terms of intimacy and proximity, in enabling a conversation about mammography:

“Closer personal relationship with easier communication”. (271275REA, *control*)

“Closer geographic distance”. (170683LUD, *experimental*)

Other, more minor themes that emerged as participants considered potential facilitators of the conversation were the presence of a family history of breast cancer, and the older female family member having a more positive attitude towards discussing mammography.

Of those who successfully initiated upward family communication about mammography, 59% reported there were no barriers to doing so. Unlike in Study 2, those who reported no perceived barriers to initiating the conversation were approximately equally split between the control and experimental groups. In comparison, only 25% of participants who did not initiate upward family communication about mammography reported an absence of barriers. Thus, as might be expected, those who did not initiate upward family communication about mammography were more likely to report more barriers to this behaviour.

As stated at the beginning of this section, themes and categories previously identified in a similar sample for Study 2 were used to code participants' responses about perceived barriers to the target behaviour. As in Study 2, the barriers that were identified did not reflect novel themes, but instead described a “lack of” the factors previously identified as facilitators. However, two noteworthy results emerged. Firstly, 18% of responses referred to the fact that the conversation topic was of a private and sensitive nature, and that this made it difficult or awkward to initiate. Secondly, some participants explained that they perceived the topic as irrelevant. While such a response

only reflected 8% of all responses, it is interesting to note that 80% of responses reflecting this theme came from participants in the experimental group.

8.4 Discussion

This study was designed to replicate some of the results of Study 2 using a demographically similar (but independent) sample, as well as to trial a novel motivational intervention to promote upward family communication about mammography. Specifically, this study sought to (1) replicate the application of the TPB to the target behaviour, and gather additional information about the predictors of this behaviour, (2) trial a CFT intervention that attempted to facilitate upward family communication about mammography, and (3) provide additional evidence for the viability of an upward family communication strategy to promote mammography to target women. Results pertaining to each of these aims will be discussed in turn. Where the results of this study also relate to the contribution of Study 2, this is also discussed in each section.

8.4.1 Utility of TPB

Attitude, subjective norm, perceived behavioural control, and intention (the TPB variables) were all highly correlated with one another, as measured with reference to upward family communication about mammography. Higher levels of intention to engage in upward family communication about mammography were associated with more positive attitudes towards performing the behaviour, favourable subjective norms about performing the behaviour, and the perception that the behaviour was within one's control. Thus, the observed relationships between the TPB variables in this study were consistent with those posited in the TPB model (see Ajzen 1985, 1991). While a regression model that included attitude, subjective norm, and perceived behavioural control was successful at predicting intention and accounted for 27 percent of the variance in intention (lending support to the TPB model), only attitude was a significant independent predictor of intention. Attitude has been shown to be the strongest predictor of intention to perform a range of health behaviours such as organ donation (Hyde & White, 2009; Skowronski, 1997), mother's healthy dietary decisions for their infants (Beale & Manstead, 1991), and screening behaviours (see review by Cooke & French, 2008). In the context of the current study, this result suggests that a positive evaluation

of the target behaviour was the primary determining factor in deciding to perform the behaviour (i.e. forming an intention to perform the behaviour).

The relationships amongst the TPB variables observed in the current study are markedly consistent with those observed by Hyde and White (2009) in a study that examined the utility of the TPB in predicting intention to discuss organ donation with a family member. Hyde and White's results demonstrated that all TPB variables were significantly and positively correlated with each other when measured in relation to family communication about organ donation. In addition, they demonstrated that a combined model of attitude, subjective norm and perceived behavioural control successfully predicted intention to engage in the target communication behaviour. Barsevick et al. (2008) also demonstrated that the TPB successfully predicted intention to discuss genetic test results with relatives (although the individual TPB variables were measured somewhat differently in this study). The results of the current study and Study 2, when taken together with the work of Hyde and White and Barsevick et al., indicate that the TPB may have the potential for predicting family health communication across a range of contexts.

The results of the current study lend stronger support to the utility of the full TPB model in predicting upward family communication than the results of Study 2. In Study 2, subjective norm failed to correlate with any other TPB variable and thus did not contribute to the model in a theoretically consistent manner. However in the current study, subjective norm was positively and significantly correlated with all other TPB variables. This occurred even though subjective norm was measured in relation to the same target behaviour using the same single item as was used in Study 2, and the sample was demographically similar to the one employed in Study 2 (females aged 18-39, mostly single, full time university students). Given that the TPB variables were measured prior to participants' exposure to the experimental manipulation, the difference cannot be attributed to any unintended effects of exposure to the vignettes. Note also that the Cronbach's alpha value for the attitude scale was notably higher for the current study (.84) than in Study 2 (.75; Cronbach's alpha values for the other scales were approximately the same between studies), even though the two studies used identical attitude scales. The robust results pertaining to the TPB scales further attest to the utility of the TPB as applied to upward family communication about mammography.

8.4.2 CFT Intervention

In the present study, participants in the experimental condition read one of two vignettes (the vignettes produced statistically equivalent results), each about a daughter deciding not to discuss mammography with her mother, and some time later her mother receiving an advanced-stage breast cancer diagnosis. Participants were then asked to record upward counterfactual thoughts (by completing “If only...” sentences) in response to the inaction and the resulting negative outcome presented in the vignette. In asking participants to write down their counterfactual thoughts in response to the vignette, their active involvement in this motivational technique was ensured. CFT moves people from thinking about “what might have been” (i.e. imagining alternative past outcomes) to thinking about “what may be” (i.e. thinking about how an alternative outcome can be achieved in the future (Boninger, Gleicher, & Strathman, 1994), and in doing also guides people to consider future behaviour. It was expected that CFT would facilitate upward family communication about mammography, as it would offer a motivational boost by strengthening behavioural intention to perform the behaviour (Smallman & Roese, 2009). However, expectations were not confirmed, as the CFT intervention was unsuccessful in producing a behavioural effect. Although more than half of the participants in this study successfully initiated upward family communication about mammography (primarily with their mothers), those in the CFT condition were no more likely to do so than controls. Further, there was no evidence that CFT produced any motivational effect, as participants who engaged in the CFT task did not experience a greater increase in intention than control participants. An increase in intention was evident across conditions, indicating that participation in the study alone served to increase motivation to initiate upward family communication about mammography. It may be that the short information paragraph on breast cancer and mammography that was provided to participants at Stage One served to increase motivation by impacting young women’s attitudes, subjective norms, and/or perceived behavioural control (TPB predictor variables). Exposure and awareness-raising as a result of participation is also likely to account for the motivational increase that was observed across conditions.

One possibility was that the true behavioural effect was masked by a number of participants forming different types of counterfactuals that were less likely to have an impact on behaviour. As noted in Section 5.2.6.5, the only other published research to

have assessed the influence of CFT on health-related behaviour is Page and Colby's (2003) study that employed a vignette about a person who developed lung complications due to smoking. Participants in their study were instructed to generate either upward, downward, additive (changing the outcome by adding an antecedent) or subtractive (changing the outcome by removing an antecedent) counterfactuals in response to this negative-outcome scenario. Following this, participants were given the option of signing up for a lung capacity test. Participants who formed upward counterfactuals were no more likely than those who formed downward counterfactuals to sign up for the lung capacity test. However, participants who formed additive counterfactuals were more likely than those who formed subtractive counterfactuals to register for a lung capacity test. Additive counterfactuals allow for the identification of a behaviour that is causally related to the desired outcome, and as such are more likely to result in a behavioural intention (Epstude & Roese, 2008). Based on these results, participants whose first thought was not an additive counterfactual were subsequently excluded from the current study and the analysis was re-run, however still no behavioural effect emerged. Note that assessing first counterfactual completion is a technique that has been used previously by other CFT researchers (e.g., Walsh & Byrne, 2007; Wells, Taylor, & Turtle, 1987).

Another factor that may have contributed to the null effect of the current study is the ambiguity in the vignettes surrounding whether or not the protagonist's mother was already having regular mammograms. The vignettes were primarily designed to highlight and facilitate the upward communication behaviour rather than the mother's screening behaviour. However, the inclusion of detail about the protagonist's mother's screening history may have served to emphasise the link between upward communication about mammography and the mother's screening behaviour, possibly increasing the motivation effect of the intervention.

Finally, the impact of relevant versus irrelevant counterfactuals was examined. The formation of irrelevant counterfactuals would not be expected to increase behavioural performance via the content-specific pathway because the content of the counterfactual would not match the required behaviour (e.g., "If only my mother was healthier"), and therefore would not activate the desired behavioural intention. In contrast, counterfactuals coded as relevant were all upward, additive counterfactuals that identified a behaviour the young woman could perform in the future in order to

encourage her mother to make healthful decisions about mammography. These counterfactuals allow for the transfer of information from the counterfactual thought to a behavioural intention. The consistency in semantic content between the counterfactual and the target behaviour, as well as the increased specificity that results from these types of counterfactuals, are both factors that increase the chances of the counterfactual influencing behaviour (Epstude & Roese, 2008).

In order to examine the possibility that irrelevant counterfactuals were masking the effect of relevant counterfactuals, the analyses were again re-done using only experimental participants whose initial counterfactual thought was consistent with the target behaviour (i.e. relevant counterfactuals). Indeed, relevant counterfactuals were far more prevalent than irrelevant counterfactuals in this study (consistent with the findings of Girroto et al., 1999, Markman et al., 1993, and McEleney & Byrne, 2006 who demonstrated that internal, controllable factors were most likely to be mutated in CFT). All participants generated at least one relevant counterfactual and for 87 percent of participants, the first counterfactual recorded was relevant. The expectation was that participants whose first counterfactual thought was consistent with the target behaviour would be more likely to engage in the target behaviour than controls. However, this classification and re-analysis did not alter the results. There was no evidence for the effectiveness of a CFT intervention, as experimental participants who formed relevant counterfactuals were no more likely to engage in upward family communication about mammography than controls. While this result is disappointing, note that it is consistent with previous TPB-based motivational interventions, which have also failed to produce a behavioural effect (e.g., Parker et al., 1996; Sheeran & Silverman, 2003).

8.4.3 Predicting Behaviour

As in Study 2, it was hypothesised that the TPB variables taken together as a model would predict behaviour, and that perceived behavioural control and intention would independently predict behaviour. If the TPB variables were effective in predicting behaviour as an aggregate model, it would be expected that a backward logistic regression procedure would retain all the variables in a predictor model. However, on the basis of inadequate likelihood ratios, attitude and subjective norm were dropped from the model. This indicates that these variables were not contributing to the prediction of whether participants initiated upward family communication about

mammography. However, both perceived behavioural control and intention were retained in the predictor model. Both variables were identified as independent predictors of the target behaviour, meaning that participants who scored higher on the perceived behavioural control and intention scales at Stage One were more likely to engage in upward family communication about mammography. In addition, participants who initiated a conversation about mammography with an older female family member had significantly higher intention and perceived behavioural control scores at Stage One than participants who did not successfully perform the target behaviour.

The finding that intention and perceived behavioural control independently predicted behaviour while subjective norm and attitude did not is consistent with the TPB. The TPB model posits that while intention and (under certain conditions) perceived behavioural control will independently predict behaviour, attitude and subjective norm will not, and instead these variables contribute to the prediction of intention. This pattern of relationships has been observed in relation to other health behaviours such as condom use (Sheeran & Orbell, 1998), physical activity (Conner & Godin, 1997), and quitting smoking (Conner & Godin, 1997). Thus, the results of the current study are in line with the established pattern of results reflected in the literature. Indeed, the results of the current study are even more consistent with the TPB model than those of Study 2. In Study 2, only perceived behavioural control emerged as a significant independent predictor of behaviour, while intention only approached significance. Note that in the current study, intention was the strongest behavioural predictor, although both intention and perceived behavioural control made independent contributions to the prediction of behaviour.

As in Study 2, it is likely that perceived behavioural control emerged as an independent predictor of behaviour because actual volitional control over the behaviour was reduced (a phenomenon outlined by Ajzen, 1991). In this study, successfully engaging in upward family communication about mammography was not solely dependent on the young woman. The young woman's relationship with her mother, her mother's receptiveness, as well as environmental considerations (e.g., living far away from her mother) are just a few of many possible external factors that may have influenced behavioural performance. Thus the young woman does not have complete volitional control over the behaviour. Under such circumstances there is likely to be more variation in perceived behavioural control amongst participants, and those who

perceive more control are more likely to successfully engage in the target behaviour. Thus, as actual volitional control over the behaviour decreases, the strength of perceived behavioural control as a predictor is likely to increase. This phenomenon explains why perceived behavioural control emerged as an independent predictor of behaviour both in the current study and in Study 2.

Past behaviour and selected demographic variables were also explored as possible predictors of behaviour. Past behaviour was not associated with behavioural performance in this study, and the only demographic variable retained in the final logistic model was income, though it did not make any independent contribution to the prediction of behaviour. However, this does signify that young women in this study who were from higher-income households were more likely to initiate upward family communication about mammography. One factor that may have confounded this result is the living arrangements of the participant. While participants' living arrangements were not documented in this study, it is possible that those reporting a higher household income currently reside with their parent(s), and therefore are more likely to have regular contact and conversations with their mother. Indeed, most participants were single, undergraduate students, and it is common in Australia to reside in the family home whilst completing tertiary study. Participants reporting lower household incomes may live outside of the family home, and therefore their contact with older female family members may be reduced. Alternatively, the links between higher levels of income and higher educational attainment may be another possible explanation of the relationship between income and conversational behaviour, as members of a more highly educated family may be more likely to be aware of, and discuss, mammography.

That past behaviour did not predict current behavioural performance actually attests to the predictive power of the logistic model. Past behaviour should predict future behaviour if conditions remain unchanged. If the predictive model takes into account all the necessary conditions, past behaviour should not contribute to future behaviour beyond the variables already included in the model. Ajzen (1991) suggests that a model's sufficiency is indicated when past behaviour does not increase the predictive power of the model, which is exactly the result observed in the current study.

The findings from previous research indicate that a family history of disease can impact behaviour related to secondary prevention of that disease. For example, knowledge of a family history of hereditary cancers or Huntington's disease facilitated

family communication about genetic test results (Wilson et al., 2004). Further, a family history of breast cancer increased the likelihood that women would adhere to mammography screening guidelines (Allen et al., 1998). However, in the current study and in Study Two, young women who had knowledge of a family history of breast cancer were no more likely to discuss mammography with an older female family member than those who did not report a family history. It is possible that because this target behaviour does not present any preventive health advantage to self, any increased perceived risk that may result from having a family history of breast cancer did not directly influence the behaviour being measured. Alternatively, the fact that the daughter is aware of a family history of breast cancer suggests such issues have been discussed in the past, therefore reducing the necessity to initiate a conversation about mammography in the future.

Finally, as has already been discussed, the CFT intervention did not make any contribution to the prediction of behaviour, indicating that those in the experimental condition were no more likely to initiate upward family communication than control participants.

8.4.4 Viability of an Upward Family Communication Approach to Mammography Promotion

Similar to Study 2, one of the aims of the current study was to explore the viability of promoting mammography screening to target women through their younger female relatives, in particular their daughters. While the counterfactual intervention aimed at increasing upward family communication about mammography was unsuccessful, a substantial proportion of participants initiated upward family communication about mammography, regardless of whether they were in the experimental or control conditions. Some 54 percent of young women who participated in this study successfully initiated the desired conversation. While this proportion is at chance level, the target behaviour is highly specific and cannot be expected to occur at random. Of those women who did initiate upward family communication about mammography, 92 percent indicated that the conversation had positive outcomes. The perceived outcome data in this study closely mirrored the data obtained in Study 2, as once again the two highest frequency responses were self-focussed, with participants indicating knowledge-related benefits to themselves. Most participants in this study

were young adult undergraduates, with a mean age 21;06 years. Given this, it is perhaps unsurprising that the participants' default concerns were for themselves, despite the fact that the study was framed in such a way as to emphasise the benefit to the older female family member. Note that participants were fully debriefed at Stage Two, and were provided with educational materials that emphasised that the target age group for mammography screening was women aged 50-69 years. This served to safeguard against the participants developing an age-inappropriate interest in pursuing mammography screening for themselves as a result of participating in this study. The fact that young women reported positive outcomes for themselves with such a high frequency suggests that they found the process to be constructive, beneficial, and possibly even interesting (given that 41 participants reported they are now more likely to seek out more information about mammography). These results begin to highlight the willingness of young women to act as agents for education and health behaviour change within their families.

As in Study 2, the third highest frequency response for perceived outcome of the conversation was "My older female family member is now more likely to get a mammogram". This outcome was more in line with the purposes of this study, which was to determine the viability of an upward family communication intervention to promote mammography to target women. This particular response demonstrates that young women perceived that, as a result of the conversation, their older female family member's beliefs, attitudes, and/or intentions to engage in mammography screening were positively impacted. While no data are available directly from the mothers in this study, this result is encouraging as it suggests that they were receptive to the younger woman's initiation of a conversation about mammography.

Also noteworthy are the three reports (all from participants in the experimental group) of mothers actually having a mammogram as a result of the conversation. While this reflects just a small proportion of the sample, it is an encouraging result given that the intervening time between Stages One and Two was only about eight weeks. It is possible this number could have been higher (especially given the large number of participants reporting that their mothers were now more likely to have a mammogram) if the follow-up time was extended. With the absence of baseline data (e.g., intention to screen) and reflections on the conversation from the mothers, it is not possible to validate the young women's perceptions of the conversation outcomes. However, it is a

conceptually significant trend as it once again highlights the idea that young women can successfully deliver mammography promotion messages to their mothers through everyday communication. As previously discussed in Section 7.4.4, Washington et al. (2009) suggested that upward communication about mammography may positively impact a mother's subjective norm evaluations, and therefore increase intention to screen and consequently increase the likelihood of screening behaviour. The evaluation of this suggestion is beyond the scope of the current study, but it does represent an interesting avenue for future research.

While many young women were willing and able to successfully initiate positive and productive conversations about mammography with their mothers, it was clear that most participants experienced or perceived some hurdles to doing so. Once again, the themes identified mirrored those that emerged in Study 2. All participants, regardless of whether or not they initiated the desired conversation, were asked to reflect on what could have made the process easier, and comment on any barriers to the behaviour. A substantial proportion of participants (32 percent) felt that initiating upward family communication about mammography would have been easier if there was an external prompt for initiating the conversation, such as having a pamphlet to share, or having personal contact with someone with breast cancer or who had recently had a mammogram. Young women felt that an external prompt to assist in initiating the conversation would both take some of the pressure off them, and make the conversation more natural and relevant. Future work in this area may need to include equipping young women more explicitly with tools to initiate a conversation with their mothers about mammography. Upward family communication about mammography is probably not a behaviour that participants had given much thought to prior to participation in this study (indeed the results of Study 1B suggested that such a conversation does not occur spontaneously unless the young woman herself is experiencing breast health problems). Thus, it is understandable that they felt some assistance in initiating this behaviour would have been helpful. Further, there may have been some experimenter demand effects that may have prompted the participants to initiate the conversation before returning for Stage Two, rather than waiting for a more natural time for the topic to arise in conversation. Although efforts were made to minimise participant awareness of the nature and topic of the Stage Two task, there may have been some level of insight

given that at Stage One all participants were encouraged to initiate the desired conversation with an older female family member.

Another issue noted by participants was that they would have felt more confident initiating a conversation about mammography if they were better educated about the issue themselves. In the current study, participants were only provided with brief, introductory information about the importance of mammography, particularly for women aged 50-69 years. While the information provided was apparently sufficient to facilitate upward family communication about the topic for some young women, for others a lack of comprehensive information may have been a crucial barrier. As has already been mentioned, young women may benefit from more thorough preparation and training prior to initiating upward family communication about mammography. Thorough training was outside the scope of this investigation, given it was a trial study.

Young women also frequently reflected on more positive timing, situational, or environmental factors that may have better facilitated upward family communication about mammography. More women mentioned this issue in the current study than in Study 2. Young women noted that often the busyness of the lives of both parties meant that discussing anything other than the immediate issues at hand was a low priority. Further, some young women documented that even if they themselves did take the time to bring up the conversation, their mothers were sometimes otherwise occupied and not willing or able to be attentive to the conversation. A change in some specific life circumstance at the time of participating in the study was also documented as an issue that, if resolved, could have made having the conversation easier. External environmental factors such as those noted here are not under the control of the experimenter, or even the participant to a large extent. These issues reflect the standard busyness of modern family life. However, more explicit training and instruction as to how to best bring the topic up in conversation may ameliorate some of these issues.

Closeness to one's mother was highlighted as an important consideration. Participants expressed that increased closeness, both in terms of proximity and intimacy, would make it easier to initiate a conversation about mammography with their mothers. While this study does provide evidence that young women of a particular demographic can successfully deliver mammography promotion messages primarily to their mothers, not all mother-daughter relationships would be suitable candidates for such an intervention. This finding corresponds to the results of Study 1B which

indicated that some mother-daughter dyads were more likely to engage in bidirectional, open communication about health than others. Dyads whose communication patterns were conversation-oriented were identified as particularly good candidates for an upward family communication intervention, a finding that may mirror the ‘intimacy’ concept highlighted in Studies 2 and 3.

While this section has addressed participant-identified issues that may have acted as barriers to initiating upward family communication, note that more than half (59 percent) of participants who did engage in this behaviour reported there were no barriers to doing so. In Study Two, participants who reported no barriers were predominantly from the experimental group (67 percent), suggesting that forming implementation intentions was somehow associated with a reduced perception or experience of obstacles. However, in the current study participants who reported no barriers to engaging in the desired conversation were roughly equally split between the experimental and control groups. This result may provide some insight into why CFT failed to facilitate upward family communication about mammography. Consistent with the propositions of Achtziger et al. (2008) it seemed that when participants in Study Two formed IIs it shielded their goal from interference from barriers or other negative influences. In contrast, CFT may activate a mindset that facilitates the mental simulation of alternative outcomes, which may result in the identification of more barriers to the behaviour (Galinsky & Moskowitz, 2000; Galinsky, Moskowitz, & Skurnik, 2000). The investigation of this phenomenon was beyond the scope of the current study. However, it offers a feasible explanation as to why young women who engaged in CFT considered there to be more barriers to performing the target behaviour than young women who formed implementation intentions in Study Two. If thinking counterfactually activated a mental simulation mindset whereby participants continued to imagine alternative scenarios, albeit those in the future (e.g., “What if I can’t answer all my mum’s questions about mammography?” or “What if my mum thinks mammography is an awkward topic to discuss with me?”), it is possible that some of the imagined alternatives became perceived barriers to engaging in upward family communication about mammography.

8.4.5 Limitations and Future Directions

The contributions of this study highlight the viability of an upward family communication strategy to promote mammography to target women. However, some methodological limitations restricted the extent to which the effects of the strategy could be measured. In the current study, access was restricted to the younger female participants. Thus, it was not possible to conduct follow-up with older female family members to confirm the attitudinal and behavioural outcomes of the conversation about mammography. Baseline data about the older relative's mammography awareness, perceived risk, previous screening behaviour, attitudes, beliefs and intentions would have allowed for stronger causal conclusions to have been drawn about the effects of an upward family communication strategy to promote mammography to target women. Inclusion of the conversation partner in more extensive studies of this kind in the future should be a priority.

As has already been discussed, many participants reported that they felt an external prompt would have helped them initiate the conversation. One way to overcome this may be to provide young women with explicit training on possible ways to start a conversation with their mother about mammography. Associated with this are participant reports that they felt under-equipped in terms of their own knowledge about mammography. More time spent on educating the participants about breast cancer and mammography could assist in overcoming this barrier. As already noted, only very brief information was provided for participants in the current study. Overcoming these barriers may also increase participants' sense of perceived behavioural control, which should have a positive effect on behavioural performance.

The avenues for future work on CFT as a motivational strategy to facilitate behaviour are less clear. The current study provides no support for the effectiveness of a CFT intervention to facilitate upward family communication about mammography, however other previous work (e.g., Nasco & Marsh, 1999; Page & Colby, 2003; Smallman & Roese, 2009) has provided clear evidence for the motivational effects of CFT, and the subsequent impact on behaviour (Nasco & Marsh, 1999; Page & Colby, 2003). Given the inconsistency of the available evidence, future work is warranted. A more systematic manipulation of the structure and content of the counterfactual thoughts produced may provide insight into the counterfactual mechanisms that have the greatest effect on behaviour, and those that have no effect. A study that controls

whether participants mutate factors relating to self or other, and whether participants produce additive versus subtractive upward counterfactuals would eliminate the variation within the single experimental group that was observed in the current study. The fact that experimental participants in the current study could (and did) consider any kind of upward counterfactual scenario they wished may have served to inhibit the effect of a particularly impactful type of counterfactual thought. A systematic examination of the relative effectiveness of the different types of counterfactual thoughts on producing behaviour change is warranted. Further, a slightly different approach to measuring change in motivational variables may be warranted to increase sensitivity. Taking a measure of intention immediately after engaging in CFT, as well as at Stage Two, would enable the assessment of whether there were any immediate, short-term changes in motivation to engage in upward family communication about mammography. Measuring perceived behavioural control at these intervals would also allow for a more thorough analysis of motivational changes post-CFT. One study has provided evidence that thinking counterfactually may influence perceived control over behaviour, although this construct was not measured in a manner consistent with the TPB (Nasco & Marsh, 1999). Nonetheless, the relationship between CFT and other motivational variables as identified in the TPB model may be a viable avenue for future exploration.

8.4.6 Conclusions

This study utilised CFT as a motivational intervention with the aim of facilitating upward family communication about mammography. The CFT strategy was unsuccessful, and did not produce a motivational or behavioural effect above participation in the study alone. This occurred in spite of the fact that the current study utilised an active technique to ensure participants were engaged and attending to the motivational intervention.

Although the results are consistent with previous TPB-based work, they are inconsistent with results of previous CFT research that has demonstrated the effects of CFT on behaviour change (e.g., Chan et al., 2008; Markman et al., 1993; 2008; Reichert & Slate, 2000; Roese, 1994), particularly health behaviour (Page & Colby, 2003). The lack of behavioural effect observed in the current study may be due to the fact that participants were not instructed to produce a particular type of counterfactual, and so

the resulting variation masked any potential effect. Another possible explanation is that thinking counterfactually does not shield a goal from negative interference from barriers the way IIs do. Nevertheless, given the inconsistency of the results of this pilot study with previous CFT research, a more thorough and systematic examination of the effects of CFT in facilitating upward family communication about mammography is warranted.

Notably, this study replicated many of the promising findings of Study 2. The current study applied the TPB to a novel behaviour, and this model successfully predicted whether or not a young woman would engage in upward family communication about mammography. Outcome data collected after participants initiated the desired conversation with their mothers about mammography indicated that young women are willing and able to initiate upward family communication to promote mammography to target women, and that this strategy had positive results. Thus, the current study further demonstrated that upward family communication is a viable avenue through which to promote mammography to target women, and has laid some groundwork for a larger-scale, longitudinal intervention of this kind to be conducted with mother-daughter pairs. The next chapter integrates the key results of each of the studies reported in Chapters 6 to 8.

9 General Discussion

9.1 Summary of Research Program

Previous TPB-based research has been criticised for relying solely on correlational data, and failing to examine possible causal effects of the TPB variables on behaviour (Webb & Sheeran, 2006). In response to this criticism, the program of research presented in this thesis used both correlational and quasi-experimental methods to examine the utility of the TPB model in predicting upward family communication about mammography, and the effectiveness of TPB-based interventions in facilitating this behaviour. A volitional and a motivational intervention, each informed by the TPB model, were piloted and evaluated as part of the current research.

The research presented in this thesis is novel in a number of respects. While other work has shown that upward family communication about health is an effective means through which to positively impact a woman's health-related attitudes and behaviours in other cultures (Gursoy et al, 2009; Mosavel, 2009; Mosavel & Thomas, 2009; Mosavel et al., 2006; Washington et al., 2009), the current project represents the first evidence that this is also true in an Australian context. Note that prior work done on upward family communication and health has been largely atheoretical, in that theory has neither been used to inspire the concept of using upward family communication as a means of health promotion, nor has it been used to inform interventions or strategies to facilitate such communication. In response to this, the current research program utilised FCP theory to inform predictions about the utility of upward communication about health (specifically mammography) within mother-daughter dyads, and applied the TPB to identify motivational predictors of upward family communication about mammography. The current project represents a novel application of both FCP theory and the TPB. In addition, this thesis presents the first evidence that a modified RFCP instrument can be used exclusively with mother-daughter dyads. The results from the studies presented in this thesis provide evidence of the appropriateness of these theoretical frameworks for use with upward family communication about mammography.

The current project also involved designing and piloting interventions informed by the TPB designed to facilitate such communication. Study 2 piloted an II (volitional) intervention that was the first attempt at using this strategy to facilitate health communication behaviour. Study 3 piloted a CFT (motivational) intervention which, based

on the literature review conducted for this project, is only the second attempt at assessing the impact of CFT on health-related behaviour.

The research program comprised both quantitative and qualitative methods across four studies, which together sought to address three aims:

1. to examine the viability of an upward family communication strategy to promote mammography to target women, against the theoretical backdrop of the Family Communication Patterns theory;
2. to use the Theory of Planned Behaviour to examine predictors of upward family communication about mammography; and
3. to trial a volitional and a motivational intervention, each designed to supplement the TPB model and facilitate upward family communication about mammography.

How the current research project met each of these aims, as well as implications of the findings are discussed in turn in the next section.

9.2 Summary and Integration of Findings

Aim 1. To examine the viability of an upward family communication strategy to promote mammography to target women, against the theoretical backdrop of FCP Theory.

FCP theory describes the possibility of bi-directional patterns of conversation and influence within a family. Such patterns may be evident in varying degrees depending on the family's conformity and conversation orientations. FCP theory stipulates that conversation-orientated families (i.e. consensual and pluralistic families) will be more likely to demonstrate effective upward *and* downward communication, whereas families that are low on the conversation orientation are more likely to show a predominance of downward communication, particularly if the family is also conformity-oriented (i.e. protective families). This theoretical framework provided a rationale within which the notion of upward family communication was explored as a mammography promotion strategy. Study 1A presented an internally consistent, modified RFCP instrument for use specifically with mother-daughter dyads, and the findings of Study 1B demonstrated that the modified RFCP instrument can successfully differentiate between mother-daughter dyads with different communication patterns in a theoretically consistent manner. The results of these studies provide support for the utility and appropriateness of using FCP theory as a rationale for exploring upward

family communication as a mammography promotion strategy, and also highlight that such a strategy may be particularly effective for use with conversation-oriented dyads.

As well as demonstrating the use of FCP theory with mother-daughter dyads, the results of Study 1B provided the first evidence that an upward family communication strategy to promote mammography to target women might be viable. Through semi-structured interviews with mothers and their adult daughters, it was found that upward communication about health was characteristic of communication patterns of mother-daughter dyads, and that such communication oftentimes resulted in positive changes in the mother's health-related attitudes or behaviours. However, it was also evident that upward family communication about mammography did not spontaneously occur with the intention of positively influencing the mother. It was concluded that daughters need to be prompted to engage in upward family communication about mammography, and that this would likely be successful given the finding that frequent upward family communication about other health topics was apparent.

Studies 2 and 3 provided convergent evidence for the findings outlined above. The results of these pilot intervention studies indicated that young women were willing to discuss mammography with their older female family members (primarily their mothers), and that they were capable of initiating such a discussion with reported positive outcomes for both parties. In particular, daughters frequently reported that as a result of having initiated a conversation about mammography with their older female family member, this relative was now more likely to undergo mammographic screening. However, it was evident from these studies that young women require more support if they are to overcome the perceived barriers and be maximally effective in participating in an upward family communication strategy to promote mammography to target women. Training in communication strategies, and/or the provision of materials that young women could share with their mother as they conversed should be incorporated into future interventions of this type.

Overall, the studies presented in this thesis indicate that an upward family communication strategy to promote mammography to target women is certainly viable. With some minor modifications, an upward family communication strategy as explored in this project may be a powerful means through which to educate target women about mammography, and prompt them to undergo mammographic screening.

Aim 2: To use the Theory of Planned Behaviour to examine predictors of upward family communication about mammography.

The TPB is the theoretical framework that was applied to upward family communication about mammography in order to gain an understanding of the antecedents of this behaviour. While the TPB has been successfully applied to other communication behaviours (e.g., Barsevick et al., 2008; Hyde & White, 2009), Studies 2 and 3 represent the first attempts to apply the TPB to upward communication about mammography between mother-daughter dyads. The assessment of the utility of the TPB model to predict and explain upward family communication about mammography was replicated between Studies 2 and 3. This strategy enabled data to be collected from two demographically similar but independent samples, lending more weight to the findings, which were largely uniform across both studies. The relationships observed between TPB variables in both studies were theoretically consistent, and the model predicted both intention and behaviour to a similar extent as has been previously demonstrated in other behaviour change studies (Ajzen, 1991; Conner & Armitage, 2001; Cooke & French, 2008; Godin & Kok, 1996). Both intention and perceived behavioural control were identified as the strongest predictors of the target behaviour. Previous behaviour and family history of breast cancer did not contribute to the prediction of the target behaviour, further indicating the sufficiency and utility of the TPB (Ajzen, 1991). Overall, the results indicated that the TPB was an appropriate and effective framework to use for predicting upward family communication about mammography. Although much research attention has been given to the predictive power of the TPB (see Ajzen, 1991 and Armitage & Conner, 2001 for reviews), less attention has been given to the design and evaluation of TPB-based interventions. The program of research presented in this thesis piloted two strategies as supplements to the TPB model with the aim of facilitating upward family communication about mammography, as summarised in the next section.

Aim 3: To trial a volitional and a motivational intervention, each designed to supplement the TPB model and facilitate upward family communication about mammography.

While the TPB is an effective and frequently used model for predicting and explaining health-related behaviour (Armitage & Conner, 2001; Cooke & French, 2008;

Godin & Kok, 1996), there is a well-documented intention-behaviour gap (Conner & Armitage, 1998; Conner & Norman, 2005; Hardeman et al., 2002; Renner & Schwarzer, 2003; Sheeran & Orbell, 1998), and TPB-based motivational interventions have generally failed to facilitate behaviour change (e.g., Parker et al., 1996; Sheeran & Silverman, 2003). There are two possible explanations for these findings. The first is that the absence of volitional mechanisms proposed in the TPB model has resulted in a framework that can adequately predict, but not facilitate behaviour change. In response to this criticism of the model, many researchers have begun to consider supplemental strategies that operate volitionally, assisting the conversion of intention into behaviour (e.g., Brandstatter, et al., 2001; Epstude & Roese, 2008; Gollwitzer, 1993; Orbell, Hodgkins, & Sheeran, 1997; Page & Colby, 2003; Sheeran & Orbell, 2000; Sheeran & Silverman, 2003; Steadman & Quine, 2004). Study 2 presented in Chapter 7 of this thesis involved the design and evaluation of a pilot II intervention aimed at facilitating upward family communication about mammography. This II intervention was moderately successful at bringing about the desired behaviour change, however this strategy worked best for those who initially had lower levels of intention to perform the target behaviour, and higher perceived behavioural control over the behaviour.

This result stands in contrast to previous work that has demonstrated IIs operate by translating intention into behaviour, and therefore are most effective for those who report a pre-existing intention to perform the behaviour (e.g., Armitage, 2006; 2007a; Gollwitzer, 1993; Sheeran et al., 2005). This notable difference may be due to the fact that in the current study the target behaviour was not wholly under volitional control (e.g., factors such as the mother's receptivity or not seeing the mother within the timeframe stipulated by the study may have impacted behavioural performance), and therefore an action plan formed by a young woman who fully intended to engage in the behaviour could have been thwarted by external factors. Thus the role of perceived behavioural control in II interventions should be considered. Indeed, previous researchers that have likewise documented experimental effects of IIs for low intenders (e.g., Rutter et al., 2002) have proceeded to conduct additional investigations into the relationship between perceived behavioural control and IIs (Rutter et al., 2006, 2007).

The second possible explanation for the low rate of success of previous TPB-based motivational interventions is the use of ineffective motivational strategies in the form of passive techniques that do not ensure the participants are actively engaged.

Study 3 in this thesis piloted a CFT intervention that was designed to actively engage participants in a motivational process that was expected to strengthen intention and consequently increase rates of behavioural performance. The effectiveness of CFT in facilitating health behaviour has been previously demonstrated in one study (Page & Colby, 2003), but this phenomenon has not before been explicitly explored within a TPB framework. Contrary to expectations, CFT failed to operate motivationally, as those who produced counterfactuals did not evidence stronger intentions to engage in the target behaviour than control participants. Likewise, CFT failed to produce a behavioural effect, with experimental participants and control participants being equally likely to engage in the target behaviour. This was true even when only participants whose first counterfactual thought was relevant to the target behaviour (i.e. upward, additive counterfactuals with semantic content that matched the desired behavioural plan) were included in the analysis. Although the results of the CFT intervention presented in this thesis did not support the hypotheses, further work is warranted as so few studies have addressed the relationship between CFT and health behaviour to date.

In sum, IIs appear to be a promising strategy for facilitating upward family communication about mammography, though the success of IIs may be best observed when this strategy is applied to behaviours under maximal volitional control. Although thinking counterfactually has no detectable motivational or behavioural effect, other work suggests that this strategy may still hold promise, and so the impact of CFT on health-related behaviour deserves more in-depth empirical attention.

9.3 Family Communication as Health Promotion: Further Considerations

The current project has highlighted the strong potential for upward family communication to be utilised as a means through which to deliver preventive health messages to older adults. While the program of research presented in this thesis focused on upward communication between mother and daughter about mammography promotion, there may be potential for harnessing this approach to health communication to deliver other preventive messages such as those about other cancer screening behaviours (e.g., screening for cervical and colorectal cancer, as well as melanoma), nutrition, physical activity, and smoking. In fact, the data obtained for Study 1B indicate that upward family communication about less personal topics such as diet and

exercise was a natural part of the conversations between the mothers and daughters that participated in the interviews. As already mentioned in Section 9.2, daughters may require additional information, training, and support if they are to be effective in influencing their mothers to have mammograms. The participant feedback collected at Stage Two of both Studies 2 and 3 provides valuable information about the experience of initiating upward family communication about mammography. In particular, this information provides direction for future research seeking to design and evaluate interventions that promote and facilitate upward family communication about mammography.

There are two main messages that should be attended to by future researchers in this area. The first is that participants wanted more information about mammography (e.g., clinic locations, risks) prior to initiating a conversation with their older female family members. Participants wanted to be more confident that they could answer questions should they be asked for more information. Second, participants seemed to require support or training on how to initiate a conversation of a personal or sensitive nature. This likely does not reflect an actual deficit in communication ability. Instead, it probably reflects the fact that young women perceived awkwardness and the sensitivity of the topic to be barriers to initiating the conversation, and required more confidence in planning to overcome these barriers. There is some evidence to suggest that forming an II did assist to shield the intention from interference from such barriers, and helped participants to initiate a more effective conversation (see Section 7.4.3).

The outcome data available from the studies presented in this thesis are limited to young women's self-report of their perceptions of the impact of the conversation they initiated about mammography. Although the data are encouraging, suggesting that female relatives were more likely to have a mammogram post-conversation, mammography attendance data were not obtained, nor were the female relatives' perceptions or experiences of the conversation appraised. Future work should employ a more extensive longitudinal design that includes behavioural follow-up with mothers. In conducting behavioural follow-up, consideration must be given to exactly what the desired outcome is. Studies should endeavour to not only track immediate outcomes to the intervention (e.g., the first mammogram a mother has post-intervention), but also to determine whether the intervention impacts a mother's long-term adherence to screening guidelines.

In addition, consideration should also be given to the screening status of the mothers involved in future interventions. It may be that it is easier to prompt target women to resume screening, or continue to adhere to screening guidelines, than it is to prompt women who have never been screened to commence screening (Rutter, 2000; see also Sheeran, Conner, & Norman, 2001). These groups of women differ on a range of characteristics, including the barriers they experience and/or perceive to mammography screening (Lopez, Khowry, Dailey, Hall, & Chisholm, 2009), and therefore they may have different needs when it comes to engaging in this health behaviour. It is likely, however, that upward family communication will be an effective means through which to promote mammography to target women, regardless of the psychosocial barriers they perceive. This expectation is based on the convergent evidence provided by Studies 1B, 2, and 3, which indicated that across different samples (within which there was likely to be some variance amongst the target women involved with regard to the barriers they perceived to mammography), upward family communication appeared to be a viable means of mammography promotion.

The current program of research was the first to use FCP theory to aid in understanding how, why, and under what circumstances upward family communication about health might be possible, and effective. While the results of Study 1B indicated that conversation-oriented mother-daughter dyads were more likely to report bidirectional communication about a range of topics (consistent with the predictions of FCP), Studies 2 and 3 did not measure or classify dyads based on their FCP types due to limitations of time and resources. Subsequent research should seek to further integrate the predictions of FCP with upward family communication health interventions to further ascertain whether particular dyad types are more receptive to such an intervention, as might be expected based on the findings of Study 1B. The integration of the RFCP instrument into the initial measures for both mother and daughter prior to any intervention is one simple step that could be taken to commence such investigations. This would enable classification of dyads, and subsequent comparison of intervention effects (both the effects on daughters' communication behaviours and the effects on mothers' mammography behaviours) between dyads of different types.

Finally, the current project applied the TPB model to upward family communication in order to gain an understanding of the antecedents of this behaviour. The results of Studies 2 and 3 presented in this thesis are consistent with previous work

that has demonstrated that the TPB model effectively predicts health-related family communication (e.g., Barsevick et al., 2008; Hyde & White, 2009). As well as applying the TPB to predict upward family communication, it would be interesting to measure the effects of upward family communication on TPB variables, and on behaviour. Due to the inability to follow-up with mothers, it is not known what the motivational effects of upward family communication were, nor is it known for sure whether the communication had any influence on the mothers' screening behaviour. However, a study by Bresnahan et al. (2007) demonstrated that family communication about organ donation was associated with intention to be an organ donor, and with registering to be an organ donor. This suggests that family communication has the potential to facilitate behaviour change via one or more of the TPB motivational variables. Thus, the TPB may be both a useful model for understanding the antecedents to upward family communication, and for exploring the mechanisms through which upward family communication influences behaviour.

9.4 Volitional and Motivational Interventions as Supplements to the TPB Model: Further Considerations

The TPB successfully predicted upward family communication about mammography (see Study 2 and Study 3), therefore it can be concluded with some confidence that this model is a good theoretical framework for research focusing on this target behaviour. In order to address the documented limitations of the TPB, the current program of research sought to identify and evaluate strategies that could be used as supplements to the TPB to enhance behavioural performance. The limited success of the interventions piloted in Chapters 7 and 8 necessitates further consideration be given to the use of IIs and CFT, as applied to upward family communication about mammography, before further research continues in this vein.

The use of IIs to facilitate health communication behaviour holds promise; however, the results of Study 2 were not overwhelmingly supportive of our hypotheses. Some possibilities that may explain the results obtained in the current project have already been discussed in Section 7.4.3. An additional consideration is that the nature of the IIs formed by participants in Study 2 may not have been optimal for facilitating the desired volitional effect. Firstly, the content of the IIs may not have adequately addressed potential barriers. Achtziger et al. (2008) found that participants who formed

IIs that specifically addressed a likely source of internal interference (e.g., desire cognitions and cravings) successfully reduced participants' unhealthy food intake, and he concluded that forming this kind of II may shield the goal from interference from external factors. Although perceived behavioural control was not assessed in his study, it seems likely that specifying how barriers or interferences will be addressed and overcome when they arise will increase a person's sense of control over the target behaviour.

Therefore when using IIs within the TPB framework, it is possible that they facilitate behaviour not only by converting intention into behaviour, but also by enhancing perceived control over the target behaviour. This is consistent with the results of Rutter et al. (2006) who found that IIs were only effective at facilitating attendance at a mammography clinic for those who required planning to do so (and therefore presumably had lower perceived behavioural control).

Recall that while both intention and perceived behavioural control are proximal predictors of behaviour according to the TPB, perceived behavioural control is likely to be particularly relevant when addressing upward family communication about mammography because performance of this behaviour is not wholly determined by behaviours under the volitional control of the actor. An interesting avenue for future work would be to include pre- and post-test measures of perceived behavioural control in II intervention studies, a method that has recently been adopted by other II researchers (e.g., Rutter et al., 2006, 2007). Further, the content or context of IIs could be manipulated by guiding participants to form more complex IIs in two steps: (1) identification of prominent barriers or interferences (e.g. nervousness), and (2) forming the II within the context of the specific barrier or interference. Comparing the effectiveness of IIs that address potential barriers or interferences (e.g., "When I get nervous about raising the topic of mammography with my mum after we eat dinner, I will remind myself that mammography is a normal part of a woman's life") with IIs that do not (e.g., "I will raise the topic of mammography with my mother when we talk after dinner") would be an interesting next step in the conceptualisation of II interventions. While the relationship between intention and IIs should not be neglected, future work should certainly include the examination of the relationship between perceived behavioural control and IIs, especially with regard to complex behaviours that are not wholly under volitional control.

A second consideration that should be given to the type of II used in subsequent studies is the nature of the cues identified in the plan. Ajzen, Czasch, and Flood (2009) demonstrated that a general commitment to performing the behaviour was equally as effective at bridging the intention-behaviour gap as a specific II that identified situational and environmental cues. Chapman, Armitage, and Norman (2009) also found that a standard II that identified situational cues to behaviour, and a global plan that did not identify external cues, were both successful in increasing young adults' intake of fruit and vegetables. These latest findings suggest that, contrary to initial belief, the identification of specific external cues is not necessary for IIs to be effective in converting intention to behaviour (see also Papies, Aart, & de Vries, 2009). Also in line with these findings is the work of Adriaanse et al. (2009), who found that IIs that identified motivational cues for snacking ('why', e.g., feeling bored or wanting to be social) were more successful in facilitating healthier snacking habits than IIs that identified traditional situational cues ('when' and 'where', e.g., at home, when alone). They posit that motivational cues for implementing complex behaviour change may be more important than situational cues. This concept is similar to Achtziger et al.'s (2008) findings in that both studies highlight the importance of internal cognitive factors when implementing complex behaviours. Such work represents the synergy of motivational and volitional attempts at facilitating behaviour change. Subsequent II research may benefit from the inclusion of motivational cues as part of the II formulation. This may be particularly relevant for interventions that aim to facilitate the complex behaviour of upward family communication about mammography, as a discussion of this nature is likely to be emotive, and therefore guiding young women to form IIs that identify internal, motivational cues (e.g., "I will initiate a conversation about mammography with my mother because I'm fearful of losing her to breast cancer at a young age" or "I will talk to my mother about mammography as I want to build a close relationship with her and show her I care") may be particularly effective at translating intention into behaviour. Given the emerging ideas about IIs as discussed in this section, it is possible that the IIs formed in Study 2 did not consist of the optimal structure or content to produce the desired volitional effect, and future experimental work should be devoted to identifying the most effective type of II for use with everyday health communication behaviour.

Although there are some obvious future directions for the use of IIs with everyday health communication behaviour, it is less clear how research should proceed with the use of CFT as a motivational strategy. The CFT intervention presented in Chapter 8 failed to produce any motivational or behavioural effects. Some possible design modifications that may increase the sensitivity of the measurement of the effect of the intervention have already been explored in Section 8.4.2, and will not be reiterated here. Instead this section will be devoted to broader concepts and ideas that should be considered within the context of CFT and health behaviour change.

It must be emphasised first of all that the non-significant behavioural and motivational effects of the CFT intervention employed in Study 3 are not reason enough to abandon the notion of using CFT as a health behaviour change strategy. Only one other published study has tested the effect of CFT on health behaviour, the results of which provided evidence for the effectiveness of additive counterfactuals in facilitating registration for a lung capacity test (Page & Colby, 2003). Further systematic research is required to more thoroughly explore the potential for CFT to have an impact on health behaviour change, as the scarcity of published work that providing evidence for the effect of CFT on health behaviour could reflect a publication bias. However, future work may need to first seek to develop a better understanding of the mechanisms through which CFT affects health behaviour. The current project focussed on the content-specific pathway that links CFT to behaviour via the formation or the strengthening of a behavioural intention that is consistent with the counterfactual causal statement. For example, the counterfactual thought “If only I had spoken to my mother about mammography” will result in the formation of the intention to do so in the future, which consequently increases the likelihood that the behaviour will be performed. As already stated, these expectations were not met in Study 3.

One avenue that may enable effective integration of CFT research with health behaviour research is the investigation of the role of anticipated regret in behaviour change. Anticipated regret is the perception or expectation that regret will be experienced if a particular action is taken, or not taken. Anticipated regret can be induced by engaging individuals in a CFT task in response to a hypothetical scenario, a vignette, or an external real-life situation (e.g., something bad happening to a friend). Indeed, other work has demonstrated that thinking counterfactually results in feeling regretful (e.g., Zeelenberg et al., 1998), and that anticipating counterfactual regret

results in behaviour that maximises the chances of avoiding the actual regret experience (e.g., Hetts, Boninger, Armor, Gleicher, Nathanson, 2000).

Of particular interest here, previous research has also investigated the role of anticipated regret in facilitating behavioural performance within the context of the TPB model. Anticipated regret contributes independently to the prediction of both intention and behaviour when included as an independent component of the TPB model as applied to sexual risk-taking behaviour (Richard, van der Pligt, & de Vries, 1996), gambling (Sheeran & Orbell, 1999), smoking (Conner, Sandberg, McMillan, & Higgins, 2006), and cervical cancer screening (Sandberg & Conner, 2009). Thus, within the context of the current project, young women could be induced to anticipate feeling regretful if they did not engage in upward family communication about mammography by reading the vignette and responding with counterfactual thoughts such as “If only I had spoken to my mother about mammography so that she knew how to prevent a late-stage breast cancer diagnosis”. The content-specific pathway may still be activated (and thus CFT may still operate as a supplement to the TPB, as proposed in the current project), with anticipated regret influencing the formation of an intention to engage in the target behaviour, which results in an increased likelihood that the behaviour will be performed in the future.

Of course, the absence of a measure of anticipated regret in Study 3 does not necessarily explain why the results were theoretically and empirically inconsistent. Anticipated regret may still have contributed to post-intervention motivational and behavioural effects, even if it was not assessed in the study. However, Sandberg and Conner (2009) present evidence for a mere measurement effect of anticipated regret, indicating that simply measuring anticipated regret (rather than inducing it) was enough to increase cervical cancer screening attendance. Therefore the inclusion of an anticipated regret component in Study 3 may have resulted in a more effective CFT intervention.

A final, more general consideration that must be given to future TPB-based interventions is the role of affect in inducing behaviour change. That the TPB model (along with many other social cognitive models of behaviour) ignores the relationship between affect and behaviour is a common criticism (e.g., van der Pligt, Zeelenberg, van Dijk, de Vries, & Richard, 1998), with anticipated regret being only one of many possible affective states that may contribute to behaviour change. Consider for example

the research by Lawton, Conner, and Parker (2007), which demonstrated the importance of considering the role of affect when attempting to understand risky behaviours that jeopardize one's health (e.g., speeding, smoking). Further, Lawton, Conner, and McEachan (2009) demonstrated that affective beliefs were significantly better predictors of a range of health behaviours than were cognitive beliefs. In fact, affective beliefs were significantly better predictors of nine out of 14 health behaviours, five of which were preventive health behaviours. Lawton et al. (2009) conclude that interventions that target the emotional determinants of behaviour may be more effective than those that target cognitive variables alone. Subsequent research into motivational and volitional TPB-based interventions should also seek to identify and incorporate affective antecedents to behaviour.

The outcomes of the current project highlight the necessity of continued attention to both motivational and volitional predictors and facilitators of health communication behaviour (a need also highlighted by previous health behaviour change researchers, e.g., Armitage, 2007; Kellar & Abraham, 2005). An over-emphasis on the motivational phase of behaviour change to the exclusion of volitional phase research ignores the established intention-behaviour gap. Conversely, an approach that narrowly focuses on action implementation strategies is in danger of becoming atheoretical, neglecting the more distal social cognitive and affective factors that are known to influence attention, intention, and commitment, and consequently behaviour. Continued, systematic research that employs not only correlational methods but also experimental methods to examine the motivational and volitional antecedents of behaviour within the context of the TPB model is certainly warranted.

9.5 Practical Implications and Applications

The research project presented in this thesis was decidedly inter-disciplinary, as it applied psychological and communication theory to a public health problem. Up to this point, much of the discussion of the findings of this project has focussed on the theoretical and methodological implications. This section will explore the broader practical implications and possible applications of the current research.

The findings presented in this thesis indicate that a theory-based upward family communication strategy to promote mammography to target women is likely to be viable and effective in an Australian context. Australia's population-based

mammography screening program (BreastScreen Australia) has a national participation rate of only 57.1 percent of eligible women (note however that it is possible that this figure is an underestimation, as a consequence of some women attending private mammography clinics). This participation rate is markedly lower than the target 70 percent (BreastScreen Australia National Advisory Committee & Department of Health and Aged Care, 2000), and breast cancer remains a leading cause of cancer-related deaths for Australian women. Therefore it is paramount to continue the effort to identify effective mammography promotion strategies, and to design and refine interventions that will succeed in facilitating adherence to BreastScreen Australia's mammography screening recommendations. The upward family communication strategies piloted in the current project are a promising avenue for future mammography promotion interventions in Australia. Interventions aimed at daughters of target women that encourage them to discuss early detection of breast cancer through mammography with their mothers may assist in increasing the BreastScreen Australia participation rate. An increase in the national participation rate will translate into earlier detection of the disease resulting in less invasive and more effective treatments (e.g., Hall et al., 1992), and lower mortality rates from breast cancer (Humphrey et al., 2002; Kerlikowske et al., 1995).

The upward family communication strategy explored in this project may be a particularly effective means for preventive health promotion for socially disadvantaged populations. Cancer mortality rates (including those from breast cancer) amongst socially and economically disadvantaged groups in Australia are significantly higher than for groups who experience less social and economic disadvantage (Draper, Turrell, & Oldenburg, 2004), and similar cancer outcome disparities are evident in the United States (Ries et al., 2008). It is apparent there is a dire need for interventions to promote mammography to target women from these demographic groups. In communities of lower socioeconomic status, younger generations of women are likely to be more highly educated than their mothers or grandmothers (Mosavel et al., 2006; this is also evident in the small sample of Study 1B), and thus a daughter may assist in bridging the gap between the health care system and her older relatives (Tejeda et al., 2009). Ackerson and Viswanath (2009) argue that interpersonal health communication may mediate the relationships between race and socioeconomics, and health outcomes. While communication inequalities may still exist, these are more easily modified and

addressed than other disparities such as those of environment, economics, education, or opportunity.

A particularly promising avenue of intervention may be to target first generation high school graduates or university students for participation in an upward family communication intervention to promote mammography to their mothers and/or other older female relatives. The pursuit of further education represents a “teachable moment” in a person’s life (Jones et al., 2007), and more highly educated women may have additional credibility in their communities (Mosavel et al., 2006; Tejeda et al., 2009). Finally, an intervention that targets young women and facilitates upward family communication has the additional benefit of influencing the preventative health attitude and behaviour of two generations simultaneously (Mosavel et al., 2006).

A final consideration should be given to the applicability of a theory-based upward family communication intervention to promote other preventive health behaviours. Indeed, other work has identified the influence offspring have on their parents with regard to quitting smoking (Patten et al., 2004) and dietary changes (Rimal & Flora, 1998). However, there is substantial evidence to suggest that everyday health communication amongst family members is largely the domain of women (e.g., Barsevick et al., 2008; DiIorio et al., 1999; Dodd-McCue et al., 2007; DuRant et al., 2006; Forrest et al., 2003; Green, et al., 1997; Macdonald et al., 2007; Thompson et al., 2004b). Speculatively, a strategy that attempted to prompt upward family communication about health amongst males may not hold as much potential, as health communication may not be a regular feature of the patterns of interaction within this dyad, as it is between mothers and daughters (see Study 1B in Chapter 6).

9.6 Concluding Remarks

The program of research presented in this thesis contributes to the fields of health psychology, health promotion, and communication science. Based on the predictions of FCP theory, the current project has presented a means for identifying mother-daughter dyads for which such an upward family communication mammography promotion strategy might be most effective. Further, the results of this project have demonstrated that the TPB model is useful for predicting upward family communication about mammography, and has potential for guiding interventions aimed at facilitating this behaviour. This research program has also served to highlight

important avenues for future research by defining crucial research questions associated with the application of IIs and CFTs to health behaviour. However, the most substantial contribution of the current project is the provision of convergent evidence for the viability and effectiveness of an upward family communication strategy to promote mammography to target women. The implementation of an intervention that will promote and facilitate such a strategy in the community has the potential to improve adherence to mammography screening guidelines amongst target women, which in turn has the potential to reduce the breast cancer mortality rate.

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Appendix A

RFCP

Version for Mothers

This is a short questionnaire about family communication. Read each statement carefully then circle the number in the box that best describes your response, using the following scale.

1	2	3	4
Strongly disagree	Disagree	Agree	Strongly agree

Please respond to the following statements as they applied to your communication with your daughter **while she was growing up**.

Answer these questions with particular reference to your daughter who is also participating in this study.

I often say something like “You should always look at both sides of an issue”	1	2	3	4
I really enjoy talking with my daughter, even when we disagree	1	2	3	4
If I don’t approve of it, I don’t want to know about it	1	2	3	4
We often talk as a family about things we have done during the day/week	1	2	3	4
When anything really important is involved, I expect my daughter to do as I wish without question	1	2	3	4
I like to hear my daughter’s opinions, even when I don’t agree with her	1	2	3	4
I often ask my daughter’s opinion when the family is talking about something	1	2	3	4
I encourage my daughter to express her feelings	1	2	3	4
I often say something like “You should give in on arguments rather than risk making people mad”	1	2	3	4
I often say something like “You’ll know better when you’re older”	1	2	3	4
I sometimes become irritated with my daughter’s views if they are different from mine	1	2	3	4
In our family we often talk about our feelings and emotions	1	2	3	4
My daughter can tell me almost anything	1	2	3	4
In our family, we often talk about topics like politics and religion where some persons disagree with others	1	2	3	4
I often say something like “There are some things that just shouldn’t be talked about”	1	2	3	4
As a parent I feel that it is important to be the boss	1	2	3	4
My daughter usually tells me what she is thinking about things	1	2	3	4
As a parent I usually have the last word	1	2	3	4
I often say something like “You should not argue with your parents”	1	2	3	4
I often say something like “Every member of the family should have	1	2	3	4

some say in family decisions”				
I often say something like “My ideas are right and you should not question them”	1	2	3	4
In our family we often talk about our plans and hopes for the future	1	2	3	4
I encourage my daughter to challenge my ideas and beliefs	1	2	3	4
I tend to be very open about my emotions	1	2	3	4
My daughter and I often have long, relaxed conversations about nothing in particular	1	2	3	4
When my daughter is at my house, I expect her to obey my rules	1	2	3	4

Version for Daughters

This is a short questionnaire about family communication. Read each statement carefully then circle the number in the box that best describes your response, using the following scale.

1	2	3	4
Strongly disagree	Disagree	Agree	Strongly agree

Please respond to the following statements as they applied to your communication with your mother **while you were growing up**.

My mother often says something like “You should always look at both sides of an issue”	1	2	3	4
I really enjoy talking with my mother, even when we disagree	1	2	3	4
If my mother doesn’t approve of it, she doesn’t want to know about it	1	2	3	4
We often talk as a family about things we have done during the day/week	1	2	3	4
When anything really important is involved, my mother expects me to do as she wishes without question	1	2	3	4
My mother likes to hear my opinions, even when she doesn’t agree with me	1	2	3	4
My mother often asks my opinion when the family is talking about something	1	2	3	4
My mother encourages me to express my feelings	1	2	3	4
My mother often says something like “You should give in on arguments rather than risk making people mad”	1	2	3	4
My mother often says something like “You’ll know better when you’re older/my age”	1	2	3	4
My mother sometimes becomes irritated with my views if they are different from hers	1	2	3	4
In our family we often talk about our feelings and emotions	1	2	3	4
I can tell my mother almost anything	1	2	3	4
In our family, we often talk about topics like politics and religion where some persons disagree with others	1	2	3	4
My mother often says something like “There are some things that just shouldn’t be talked about”	1	2	3	4
My mother feels that it is important to be the boss	1	2	3	4
I usually tell my mother what I am thinking about things	1	2	3	4
My mother usually has the last word	1	2	3	4
My mother often says something like “You should not argue with your parents”	1	2	3	4
My parents often say something like “Every member of the family should have some say in family decisions”	1	2	3	4
My mother often says something like “My ideas are right and you should not question them”	1	2	3	4

In our family we often talk about our plans and hopes for the future	1	2	3	4
My mother encourages me to challenge her ideas and beliefs	1	2	3	4
My mother tends to be very open about her emotions	1	2	3	4
My mother and I often have long, relaxed conversations about nothing in particular	1	2	3	4
When I am at my mother's house, I am expected to obey her rules	1	2	3	4

Appendix B

Interview Schedule

Semi-Structured Interview Schedule for Mothers and Daughters

Mother-Daughter Communication (General)

Can you tell me about a time when it was easy to communicate with your mother/daughter about a personal or sensitive issue?

- Specifics of situation, context, surroundings, what made it easy

Can you tell me about a time when it was hard to communicate with your mother/daughter about a personal or sensitive issue?

Mother-Daughter Communication about Health

Can you tell me about a time that you and your mother/daughter have communicated about a health-related issue?

- Specific topic?, What prompted conversation?, Who initiated?
- Hard, easy?, Norm?, Outcome?

Can you tell me about a time when you had to make an important decision about your health? (NB: if no examples re: health, other important personal life decisions)

- influences, what was the decision based on, information seeking behaviour
- Thoughts, feelings, attitudes

Can you tell me about a time when your mother/daughter played a role in your decision-making about your health?

Can you tell me about a time when your mother/daughter had to make an important decision about her health?

Can you tell me about a time when you played a role in your mother/daughter's decision-making about her health?

Mother-Daughter Communication about Mammography

Can you tell me about a time that you and your mother/daughter have communicated about mammography (breast screening)? (If no, other screening behaviour e.g. pap smear, skin cancer, cholesterol, blood pressure)

- What prompted conversation? Who initiated?
- Hard, easy? Do, feel? Norm? Outcome?

Imagine a hypothetical mother and daughter are spending time together, chatting. Imagine that as they talked, the daughter brings up the topic of mammography.

What reasons might she have for wanting to talk about mammography?

What benefits would there be in the daughter wanting to have this conversation with the mother?

What might stop the daughter from starting this conversation?

Perhaps one reason why the daughter wants to talk about mammography is because she wants to encourage her mum to have a mammogram.

What information is it important the daughter have, so that she feels comfortable encouraging her mum to have a mammogram?

Appendix C

Stage One Questionnaire (Study 2)

INSTRUCTIONS:

You are participating in this study because you are not in the age range that is considered most ‘at risk’ for developing breast cancer. Women over 50 years old are encouraged to have a mammogram to screen for breast cancer every 2 years, as early detection of breast cancer increases the chances of survival. Women over 50 years of age need to be aware of the importance and benefit of regular mammography. One way that we can make ‘at risk’ women more aware of the benefits and importance of regular mammography is by discussing the issue with them.

This questionnaire asks about YOUR views on the topic of family communication about mammography. There are no correct or incorrect answers, we are simply interested in your personal point of view, so please answer as honestly as possible.

Many questions in this survey use 7-point rating scales, such as the one below. You are to circle the number that best describes your opinion.

good : 1.....2.....3.....4.....5.....6.....7 : bad
extremely quite slightly neither slightly quite extremely

When answering the questions, please remember the following:

- **You must answer ALL questions - do not leave any out**
- **Do NOT circle more than one number on any one scale – just pick the number that best describes your opinion**
- **Read the descriptive labels at the 2 ends of the scales carefully: they differ for each question**

Thank you for your participation.

1. Have you ever spoken with an **older female family member** (someone more likely to be in the 'at risk' age group) about mammography?

- ☐ Yes, several times
- ☐ Yes, just once
- ☐ No, never
- ☐ Can't remember

2. Which **older female family member** are you **most likely** to discuss such health issues with?

- ☐ Mother
- ☐ Step-mother
- ☐ Grandmother
- ☐ Aunt
- ☐ Other (please specify).....

For the following questions, please respond by circling the number that best describes your view about each statement. When the statement refers to "my older female family member", please answer with reference to the person you have nominated above in Question 2.

3. I am confident that I can initiate a conversation with my older female family member about mammography in the next 2 months.

very confident : 1.....2.....3.....4.....5.....6.....7 : very unconfident

3. I will try to have a conversation about mammography with my older female family member in the next 2 months.

definitely true : 1.....2.....3.....4.....5.....6.....7 : definitely false

4. For me to initiate a conversation about mammography with my older female family member would be:

extremely harmful: 1.....2.....3.....4.....5.....6.....7: extremely beneficial

5. Most people whose opinions I value would approve of me talking to my older female family member about mammography.

definitely true : 1.....2.....3.....4.....5.....6.....7 : definitely false

6. For me to initiate a conversation about mammography with my older female family member is:

very unimportant : 1.....2.....3.....4.....5.....6.....7 : very important

7. I intend to initiate a conversation with my older female family member about mammography within the next 2 months.

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

8. For me to initiate a conversation about mammography with my older female family member would be:

very easy : 1.....2.....3.....4.....5.....6.....7 : very difficult

9. For me to initiate a conversation about mammography with my older female family member would be:

very desirable : 1.....2.....3.....4.....5.....6.....7 : very undesirable

10. If I wanted to, I could easily initiate a conversation with my older female family member about mammography within the next 2 months.

strongly disagree : 1.....2.....3.....4.....5.....6.....7 : strongly agree

11. Most women my age talk to their older female family members about mammography.

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

12. Initiating a conversation with my older female family member about mammography is:

outside my control: 1.....2.....3.....4.....5.....6.....7 : under my control

13. For me to initiate a conversation about mammography with my older female family member would be:

extremely worthwhile:1.....2.....3.....4.....5.....6.....7:extremely worthless

14. I feel capable of initiating a conversation about mammography with my older female family member.

strongly disagree : 1.....2.....3.....4.....5.....6.....7 : strongly agree

15. For me to initiate a conversation about mammography with my older female family member would be:

very foolish : 1.....2.....3.....4.....5.....6.....7 : very wise

16. I am discouraged from initiating a conversation about mammography with my older female family member because I'm unsure how to raise the topic.

strongly disagree : 1.....2.....3.....4.....5.....6.....7 : strongly agree

17. I plan to have a conversation about mammography with my older female family member in the next 2 months.

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

It is important for young women to discuss mammography with female family members who are in the 'at risk' age group (over 50 years old). It is important because it helps raise awareness about breast cancer screening: both its availability and its benefits. Over the next 2 months or so, you may consider discussing mammography with the older female family you nominated at the beginning of this questionnaire.

Participants in the experimental group also received the following activity:

You are more likely to initiate a conversation about mammography with the older female family member you nominated at the beginning of this questionnaire if you decide when, where, and how this might take place. Write these decisions down in the space provided below.

Who will you have the conversation with?

.....

When will you initiate the conversation?

.....

.....

Where will you be when you initiate the conversation?

.....

.....

How will you start the conversation?

.....

.....

.....

Appendix D

Stage Two Questionnaire (Study 2 and Study 3)

Approximately 2 months ago you participated in a study on your views about mammography. The study emphasised initiating a conversation with an older female family member about mammography. This questionnaire is Stage 2 of the study on young women's views about mammography. There are no correct or incorrect answers, we are simply interested in your personal point of view, so please answer as honestly as possible.

1. Have you initiated a conversation about mammography with an older female family member since participating in Stage 1?

- ☐ Yes, I definitely did (**go to Q. 2**)
- ☐ No, I definitely did not (**go to Q. 8**)

2. Who did you have a conversation about mammography with?

- ☐ Mother
- ☐ Step-mother
- ☐ Grandmother
- ☐ Aunt
- ☐ Other (please specify).....

3. To which age group does the person you nominated above belong?

- ☐ 18-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-69
- ☐ 70+

4. Which of the following do you perceive to be a **consequence of your discussion** about mammography? (tick all that apply)

- ☐ I am now more aware about the importance of mammography
- ☐ My older female family member is now more aware of the importance of mammography
- ☐ I am now more aware of the disadvantages of mammography
- ☐ My older female family member is now more aware of the disadvantages of mammography
- ☐ My older female family member has had a mammography as a result of our discussion
- ☐ My older female family member is now more likely to have a mammogram
- ☐ My older female family member is now less likely to have a mammogram
- ☐ I am now more likely to seek out information about mammography
- ☐ My female family member is now more likely to seek out information about mammography
- ☐ No consequences or outcome
- ☐ Other (please specify).....

.....

5. What could have made initiating a conversation about mammography easier?

.....

.....

6. Were there any barriers that made it difficult for you to initiate a conversation about mammography?

.....

.....

7. I intend to initiate a conversation(s) about mammography with an older female family member in the future

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

8. I will try to have a conversation(s) about mammography with an older female family member in the future.

definitely true : 1.....2.....3.....4.....5.....6.....7 : definitely false

9. I will plan to initiate a conversation(s) about mammography with an older female family member in the future

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

Thank you for your participation.

Appendix E

Stage One Questionnaire (Study 3)

INSTRUCTIONS:

You are participating in this study because you are not in the age range that is considered most ‘at risk’ for developing breast cancer. Women over 50 years old are encouraged to have a mammogram to screen for breast cancer every 2 years, as early detection of breast cancer increases the chances of survival. Women over 50 years of age need to be aware of the importance and benefit of regular mammography. One way that we can make ‘at risk’ women more aware of the benefits and importance of regular mammography is by discussing the issue with them.

This questionnaire asks about YOUR views on the topic of family communication and mammography. There are no correct or incorrect answers, we are simply interested in your personal point of view, so please answer as honestly as possible.

Many questions in this survey use 7-point rating scales, such as the one below. You are to circle the number that best describes your opinion.

good : 1.....2.....3.....4.....5.....6.....7 : bad
extremely quite slightly neither slightly quite extremely

When answering the questions, please remember the following:

- **You must answer ALL questions - do not leave any out**
- **Do NOT circle more than one number on any one scale – just pick the number that best describes your opinion**
- **Read the descriptive labels at the 2 ends of the scales carefully: they differ for each question**

Thank you for your participation.

1. Have you ever spoken with an **older female family member** (someone more likely to be in the 'at risk' age group) about mammography?

- ☐ Yes, several times
- ☐ Yes, just once
- ☐ No, never
- ☐ Can't remember

2. Which **older female family member** are you **most likely** to discuss such health issues with?

- ☐ Mother
- ☐ Step-mother
- ☐ Grandmother
- ☐ Aunt
- ☐ Other (please specify).....

For the following questions, please respond by circling the number that best describes your view about each statement. When the statement refers to "my older female family member", please answer with reference to the person you have nominated above in Question 2.

3. Please rate how easy or difficult it is for you to initiate discussion about such health issues with the person you nominated above.

very easy : 1.....2.....3.....4.....5.....6.....7 : very difficult

4. I am confident that I can initiate a conversation with my older female family member about mammography in the next 2 months.

very confident : 1.....2.....3.....4.....5.....6.....7 : very unconfident

5. I will try to have a conversation about mammography with my older female family member in the next 2 months.

definitely true : 1.....2.....3.....4.....5.....6.....7 : definitely false

6. For me to initiate a conversation about mammography with my older female family member would be:

extremely harmful: 1.....2.....3.....4.....5.....6.....7: extremely beneficial

7. Most people whose opinions I value would approve of me talking to my older female family member about mammography.

definitely true : 1.....2.....3.....4.....5.....6.....7 : definitely false

8. For me to initiate a conversation about mammography with my older female family member is:

very unimportant : 1.....2.....3.....4.....5.....6.....7 : very important

9. I intend to initiate a conversation with my older female family member about mammography within the next 2 months.

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

10. For me to initiate a conversation about mammography with my older female family member would be:

very easy : 1.....2.....3.....4.....5.....6.....7 : very difficult

11. For me to initiate a conversation about mammography with my older female family member would be:

very desirable : 1.....2.....3.....4.....5.....6.....7 : very undesirable

12. If I wanted to, I could easily initiate a conversation with my older female family member about mammography within the next 2 months.

strongly disagree : 1.....2.....3.....4.....5.....6.....7 : strongly agree

13. Most women my age talk to their older female family members about mammography.

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

14. Initiating a conversation with my older female family member about mammography is:

outside my control: 1.....2.....3.....4.....5.....6.....7 : under my control

15. For me to initiate a conversation about mammography with my older female family member would be:

extremely worthwhile:1.....2.....3.....4.....5.....6.....7:extremely worthless

16. I feel capable of initiating a conversation about mammography with my older female family member.

strongly disagree : 1.....2.....3.....4.....5.....6.....7 : strongly agree

17. For me to initiate a conversation about mammography with my older female family member would be:

very foolish : 1.....2.....3.....4.....5.....6.....7 : very wise

18. I am discouraged from initiating a conversation about mammography with my older female family member because I'm unsure how to raise the topic.

strongly disagree : 1.....2.....3.....4.....5.....6.....7 : strongly agree

19. I plan to have a conversation about mammography with my older female family member in the next 2 months.

very unlikely : 1.....2.....3.....4.....5.....6.....7 : very likely

It is important for young women to discuss mammography with female family members who are in the 'at risk' age group (over 50 years old). It is important because it helps raise awareness about breast cancer screening: both its availability and its benefits. Over the next 2 months or so, you may consider discussing mammography with the older female family you nominated at the beginning of this questionnaire.

Participants in the experimental group also received one of the following two activities:



When she was a first year university student, Grace learned about the importance of regular mammography for women over 50 in a lecture. She wondered whether or not her 53 year old mother had regular mammograms. But whenever Grace and her mum were talking at home, Grace never brought it up in conversation as she felt it would be awkward to ask about that sort of thing. She also didn't want to cause her mother to worry.

However, recently Grace's mother has been diagnosed with Stage 2 breast cancer. After finding out about her mother's diagnosis, Grace had a lot of thoughts about things she could have done differently. "If only..."

If you were Grace, what "If only..." thoughts would be going through your mind? Write down as many as you can think of.

If only....

If only....

If only....

If only....

If only....



Joanna recently read an interview with a breast cancer survivor in a women's health magazine. The survivor was 64 years old, about the same age as Joanna's own mother. The magazine article said that for women of this age, routine mammography is the best way to find breast cancer early and therefore increase the chances of survival, just as the woman interviewed had done. After reading this, Joanna considered ringing her own mother to find out if she had regular mammograms. But Joanna decided against calling her mother. She didn't feel like she knew enough about mammography or breast cancer to discuss it, and besides there wasn't any history of breast cancer in their family.

Some time later, Joanna's mother was diagnosed with advanced breast cancer that may be life threatening. After finding out about her mother's diagnosis, Joanna had a lot of thoughts about things she could have done differently. "If only..."

If you were Joanna, what "If only..." thoughts would be going through your mind? Write down as many as you can think of.

If only....

If only....

If only....

If only....

If only....