

Understanding Young Women's Cervical Cancer Screening Attendance



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Declaration

Except where otherwise indicated, I affirm that this thesis is the result of my own research carried out under the supervision of Associate Professor Rhonda Brown. I affirm that the research presented in this thesis is predominantly my own work. The thesis is less than 40,000 words in length.

Tanya Muller

25 November 2016

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Abstract

Cervical screening to identify pre-cancerous changes, and their subsequent treatment, prevents most cervical cancers. However, recent data from Australian screening registries indicates that 42% of eligible women did not attend cervical screening in 2013–14. The rates of screening non-attendance are high and increasing among young women in Australia and other developed countries. However, there is little research to explain why young women are less likely to screen than older women. The mixed methods research presented in this thesis was designed to better understand the reasons why young women aged 25–35 years may not attend cervical screening.

Study 1 involved the collection of qualitative interview data from 20 young women to explore their experiences of cervical screening and the barriers and facilitators they encountered to screening attendance. Using thematic analysis, the results indicated that practical factors were more salient barriers to screening than psychological factors in the women who had screened before, whereas psychological barriers were most salient to women's first screening experience. In addition, the women identified the importance of General Practitioners (GPs) in facilitating their cervical screening.

In *Study 2*, survey data from 338 women was analysed to test the findings of the previous study. The women provided information on their screening history and nominated screening barriers and facilitators they encountered. These factors were categorised post hoc as either psychological or practical in nature. Results showed that reporting a greater number of psychological (but not practical) barriers was associated with being overdue for cervical screening. In addition, the women who had never screened before endorsed a greater number of psychological barriers to screening than women who had screened before. Having a regular GP was associated with older age, timely screening attendance, and fewer psychological barriers to screening.

In *Study 3*, two theoretical models of health behaviour, the *Theory of Planned Behaviour* (TPB) and *Health Belief Model* (HBM) were examined for their utility in predicting intentions to screen and screening behaviour, using survey data from *Study Two*. The women completed a series of measures that were adapted to assess the TPB and HBM in relation to cervical screening intentions and behaviour. Hierarchical multiple linear and logistic regression models indicated that the TPB predicted greater variance in intention to screen than the HBM, although the models performed similarly in predicting recent screening behaviour. In addition, having a regular GP was again highlighted as a strong predictor of screening behaviour.

The results suggest that women who have not previously screened may require additional psychological support to overcome the barriers they experience and thereby facilitate their first screening attendance. Further, having a regular GP was an important facilitator to screening attendance for all women. However, young women were less likely to have a regular GP, and this may at least partly explain their lower rates of screening attendance. Thus, encouraging young women to engage with a regular GP may improve the screening rates in this group as well as other health outcomes.

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List of Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ANU	Australian National University
CIN	Cervical intra-epithelial neoplasia
GP	General Practitioner
HBM	Health Belief Model
HPV	Human Papillomavirus
IARC	International Agency for Research on Cancer
IBM	Integrated Behavioural Model
NCSP	National Cervical Screening Program
PMT	Protection Motivation Theory
SES	Socio-economic status
SPSS	Statistical Package for the Social Sciences
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UK	United Kingdom
WHO	World Health Organization

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1. Introduction

Cervical screening and the treatment of pre-cancerous cervical changes can prevent most cervical cancers (World Health Organization [WHO], 2014). However, 42% of eligible Australian women did not attend screening for cervical cancer in 2013 and 2014 (Australian Institute of Health & Welfare [AIHW], 2016). Further, rates of non-screening attendance are high and increasing in young women in developed countries (Lancucki et al., 2010) and there is little research to explain why young women are less likely to screen than older women. Thus, the research presented in this thesis was designed to better understand the reasons why young women do or do not attend cervical screening.

1.1 Background to Cervical Cancer Screening

1.1.1 Cervical cancer and human papillomavirus.

Cervical cancer is the fourth most common cancer occurring in women worldwide (International Agency for Research on Cancer [IARC], 2014). It is a leading cause of cancer death in women, with a global yearly mortality rate of 7.6 per 100,000 women (IARC, 2014). However, it is a largely preventable cancer due to the way it develops (WHO, 2014). Human papillomavirus (HPV) DNA has been detected in more than 99% of cervical malignancies, thus, it has been determined that HPV infection is a necessary cause of cervical cancer (Bosch, Lorincz, Muñoz, Meijer, & Shah, 2002).

HPV infection is a common sexually transmitted infection and 91% of infections resolve without treatment within two years (Wang, 2007). However, in rare cases, HPV infection can persist and cause cervical intra-epithelial neoplastic (CIN) lesions, which can eventually progress to cancer (Bouvard et al., 2009). Figure 1.1 outlines how HPV infection can lead to the development of cervical cancer. There are approximately 40 different strains of HPV that can cause genital infections, with 12 of them identified as high risk strains associated with genital warts and cervical cancer. Of particular concern are the high risk types 16 and 18, which are known to cause 70–80% of all cervical



Figure 1.1. The role of HPV infection in the development of cervical cancer.

cancers (Brotherton, 2008). In addition, infection with HPV types 16 and 18 can lead to anal, penile, vaginal and oropharyngeal cancers (IARC, 2009), whereas HPV types 6 and 11 are associated with genital warts (Lacey, Lowndes, & Shah, 2006).

1.1.2 HPV vaccination.

A recent significant development in cervical cancer prevention is the HPV vaccine. The quadrivalent vaccine is administered over three doses and protects against the four strains of HPV that are thought to be responsible for 70% of cervical cancer presentations and 95% of genital warts (Dempsey & Freed, 2008). An Australian government-funded school-based HPV vaccination program began in 2007 to inoculate girls aged 12–13 years (Year Seven of schooling). Additionally, until the end of 2009, a ‘catch-up’ program was offered to girls aged 14–17 (through schools) and women aged 18–26 years (via primary health care providers). This was to maximise the coverage of young women (National Centre for Immunisation Research and Surveillance, 2014). Thus, in 2016, Australian females aged 12–35 had the opportunity to receive the HPV vaccine at no cost.

In 2013, the school-based vaccination program was expanded to include the inoculation of boys aged 12–13 years, as this is expected to increase herd immunity in both females and males, including protection against warts and anogenital cancers in men who have sex with men (Giuliano et al., 2011). By 2015, it was estimated that 85% of girls and 77% of boys aged 15 years had received at least one dose of the vaccine (National HPV Vaccination Program Register, 2016).

Promisingly, there is already evidence that the vaccine is associated with a

reduced incidence of the four strains of HPV targeted in the vaccine (Markowitz et al., 2013), as well as genital warts (Read et al., 2011) and high-risk CIN lesions (Brotherton et al., 2011; Gertig et al., 2013). A new nonavalent vaccine that protects against nine different HPV strains has recently been registered in Australia but it is not yet available for use (National Centre for Immunisation Research and Surveillance, 2016). This new vaccine will offer even more protection against the virus strains that are likely to cause cervical cancer and genital warts.

Even the new HPV vaccine does not provide full protection against the development of cervical cancer, and so cervical screening remains an important aspect of cervical cancer prevention (AIHW, 2016). Furthermore, many older women have not received the HPV vaccination and so they will require ongoing surveillance using existing cervical screening protocols, as detailed below.

1.1.3 Cervical cancer screening.

The routine screening of asymptomatic women remains an effective way to prevent the occurrence of, and mortality from, cervical cancer (WHO, 2014). In most countries, screening involves the administration of the Papanicolaou test (also known as the ‘Pap test’ or ‘Pap smear’). As outlined in Section 1.1.4, significant changes will occur to this procedure in Australia in May 2017. Pertinently, the cervical screening procedure itself does not diagnose or treat cervical cancer, rather it is typically used to identify CIN lesions that may require further monitoring and/or treatment (National Health and Medical Research Council, 2005). This procedure involves the insertion of a speculum into the woman’s vagina to open up the cavity to permit the scraping of the cervix with a brush to collect a sample of cervical cells. The sample then undergoes cytological testing to identify whether a CIN lesion is present and, if so, how far the lesion has penetrated into the surface layer of the cervix.

CIN-I lesions are defined as lesions that have penetrated less than one-third into the cervix surface layer. They are low-grade lesions that are often caused by transient

HPV infection and so have a high likelihood of resolving without treatment. The current recommended medical management of CIN-1 lesions is to simply monitor the lesion by Pap test in 12 months. CIN-2 and 3 lesions are lesions that have penetrated more than one-third into the surface layer of the cervix. Women who are identified as having these higher-grade lesions must be referred to a gynaecologist for further investigation via colposcopy and cervical biopsy, and they may require further treatment using ablative or excisional procedures (National Health and Medical Research Council, 2005).

1.1.4 Australia's cervical screening program: A time of change.

Australia's National Cervical Screening Program (NCSP) commenced in 1991, and since that time the incidence of cervical cancer diagnosis has halved due to the better detection of CIN lesions before they develop into a malignancy. However, only about one-half of the eligible Australian female population has undertaken timely screening since the program's introduction (AIHW, 2016). Hence, there appears to be as yet untapped potential to further reduce the burden of disease by increasing cervical screening rates.

Australia's NCSP is not a standalone screening service, instead it is delivered as part of routine primary health care. It is estimated that 80/% of screening is conducted by a General Practitioner (GP), though nurses and gynaecologists may also conduct the procedure (Department of Health, 2013). Cervical screening is currently subsidised via the Medicare Benefits Schedule and a rebate is paid to pathology services to offset the cost of cytology services. However, women may need to pay out-of-pocket expenses associated with the medical consultation at which the test was administered (Department of Health, 2014). Currently, Australian women are encouraged to have their first Pap test when they reach 18-years old, or within two-years of becoming sexually active, whichever occurs *later*. From that time, Pap testing is recommended to occur every two-years until the women has reached the age of 70-years. The screening recommendations do not differ based on whether the woman has or has not received the

HPV vaccine (Department of Health, 2014). Currently, women receive a letter from their state or territory screening registry reminding them to screen if they are three months overdue for screening (AIHW, 2016). However, women who have not screened previously do not receive an invitation to screen for the first time, and women who change addresses need to update their details with the registry directly.

In May 2017, a new NCSP will be implemented in Australia (Department of Health, 2015). The screening will still be administered as part of women's routine primary health care. The screening will involve a HPV test in the first instance, with a liquid-based cytology Pap test used as a follow-up test only in certain cases. The screening protocols that use HPV testing (with Pap tests used to triage positive cases) have been shown to be more sensitive to detecting CIN-2 and 3 lesions than Pap tests alone (Dillner et al., 2008), while also offering 60–70% better protection against cervical cancers (Ronco et al., 2014). Given the high prevalence of transient HPV infections that are not likely to require treatment, effective triaging processes are vital. For example, when a woman tests positive for HPV, genotyping will indicate whether she is infected with HPV types 16/18 or another strain. Additionally, a Pap test will subsequently be performed to allow for identification and grading of possible CIN lesions.

Under the new NCSP, it is recommended that HPV testing should start at 25-years of age rather than at or around 18-years, and the test is to be repeated every five years. Women will be advised to continue cervical screening until an 'exit' test is performed between 70 and 74 years. The screening guidelines will remain the same for women who have already received the HPV vaccine (Department of Health, 2015).

The new NCSP will also establish a national 'call-recall' reminder system. This means women will receive a letter inviting them to attend screening for the first time when they turn 25 years old. Women will also be invited to attend again prior to screening being due, rather than when they are three months overdue (Medical Services Advisory Committee, 2014). Finally, clinicians will be able to facilitate a

self-administered HPV test for women who are underscreened or have never screened and do not wish to undergo a clinician-administered test.

1.1.5 Cervical screening rates in Australia.

Despite the documented efficacy of cervical screening in reducing the risk of cervical cancer in women, 42% of eligible Australian women did not attend cervical screening in the most recent published reporting period (2013–2014) (AIHW, 2016). Many factors have been advanced to explain screening non-attendance. However, it is less clear *why* these factors influence screening behaviour. *Demographic factors* that are related to screening non-attendance such as age, socioeconomic status and ethnic minority status have been widely studied and will be discussed in more detail in Chapter 2.

Most previous research has been conducted internationally and focuses on socioeconomic status and ethnicity. As a consequence, this thesis explores younger age as a contributing factor for cervical screening non-attendance in Australian women. In Australia, women aged 25–29 years were the second most under-screened age group, with only 51% of them being screened during 2013–2014, compared to 64% of the women aged 45–59 years (AIHW, 2016). The only age group with lower screening rates were women aged 20–24 years (42% screened). As Australia will no longer screen women aged under 25 years from 2017 (AIHW, 2016), this age group was not studied in the research presented in this thesis. This approach is consistent with growing evidence that routine screening in this age group is not effective in reducing cervical cancer risk (Landy, Birke, Castanon, & Sasieni, 2014; M. Smith & Canfell, 2016).

1.2 Thesis Rationale

The focus of the research presented in this thesis is on the cervical screening behaviour of young women relative to older women. Screening rates are low and declining in young Australian women. Lancucki and colleagues (2010) determined that screening rates in the 25–29 age group in developed countries have decreased, and research is required to understand this trend, especially since females aged 25–29 are the

most likely to have a high-grade abnormality detected by screening (AIHW, 2016). Despite this, there is a paucity of research that has examined the factors related to younger women's screening attendance. Sadler and colleagues note that "a particular problem is the lack of evidence on which to base strategies [to promote screening] for young women" (Sadler, Albrow, Shelton, Kitchener, & Brabin, 2013, p. 793).

Given the significant upcoming changes to the NCSP, it is an opportune time to gain a better understanding of the barriers and facilitators to cervical cancer screening among Australian women. This thesis contributes an in-depth understanding of these factors, generating important knowledge for the development and implementation of the new NCSP.

1.3 Thesis Aim and Chapter Outline

This thesis presents results from three studies. The broad aim of this program of work was to understand reasons why young Australian women do or do not attend cervical screening. In *Study 1*, 20 young women living in the Canberra region were interviewed to explore their experiences of cervical screening and the barriers and facilitators they encountered to screening attendance. *Study 2* utilised survey data from 338 women living in Australia to examine the extent to which barriers and facilitators influenced screening behaviour. In *Study 3* two theoretical models of health behaviour — the *Theory of Planned Behaviour* and the *Health Belief Model* — were examined for their utility in predicting intentions to screen and screening behaviour, using survey data from Study 2.

Chapter 2 reviews the literature relating to cervical cancer screening, and summarises the main gaps that led to the development of specific aims and research questions. A brief overview of the mixed methods framework employed in this thesis is presented in *Chapter 3*, in advance of presenting the results of the studies. In *Chapter 4*, results from Study 1, exploring young women's screening barriers and facilitators, are presented. Results from Study 2 are presented in *Chapter 5*. Results of Study 1 and 2 relate to barriers and facilitators to women's screening attendance. In *Chapter 6*, results

from Study 3 are presented. This study moves beyond barriers and facilitators to compare two theoretical models of health behaviour in their ability to predict screening attendance. Finally, *Chapter 7* is a General Discussion to summarise the main findings, strengths and limitations across the thesis and discuss implications of this body of research.

2. Literature Review

In the previous chapter, background information about cervical cancer screening was discussed, highlighting the benefits of screening and the need to improve screening rates amongst young women. In this chapter, the literature examining factors that influence women's screening attendance is reviewed. As there is a paucity of literature examining young women's screening behaviour, much of the literature reviewed in this chapter relates to women of all screening ages rather than young women specifically. After identifying the key limitations of the literature, the aims and research questions for each of the studies will be presented.

2.1 Social-Cognitive Models of Health Behaviour

With regards to health behaviour, such as cancer screening attendance, engaging in exercise, ceasing smoking or receiving a vaccine, it is expected that people will engage in any behaviour where the benefits outweigh the costs; however, it is clear that this is not always the case. There are numerous theoretical models of health behaviour that have been developed and tested to explain why individuals do or do not engage in behaviours which affect their health despite clear benefits. Social-cognitive models such as *Protection Motivation Theory* (Rogers, 1975), the *Health Belief Model* (Rosenstock, 1974) and the *Theory of Planned Behaviour* (Ajzen, 1991) have proposed factors that may explain why individuals do not engage in behaviours that are beneficial to health. The theories aim to increase understanding of health behaviour, but also identify factors that can be targeted to improve engagement with these behaviours. However, there is considerable variation in how successful the models are in predicting screening behaviour, which is reviewed below.

Different models of health behaviour propose that different factors will influence behaviour, although they have the same general structure. That is, psychological factors such as *self-efficacy*, *perceived risk* and *attitudes* are said to influence an individual's *intention* to carry out a behaviour. With greater intentions come an increased likelihood

of the behaviour being performed. The models acknowledge that a broader range of factors such as cultural, structural and personality factors influence behaviour; however, models assume that these effects are largely mediated by the intrapersonal factors that are outlined in the model, and that it is more feasible to modify these individual-level factors to change behaviour (Sutton, 2001). The three social-cognitive models of health behaviour that have been most commonly applied to cervical cancer screening are briefly outlined below.

2.1.1 Protection Motivation Theory.

Protection Motivation Theory (PMT) was developed by Rogers (1975) to account for the impact of fear appeals on an individual's attitudes and behaviour. The model describes two cognitive processes, threat appraisal and coping appraisal: increased *threat appraisal* (i.e. evaluation that threat outweighs the benefits of not performing a health behaviour); and increased *coping appraisal* (i.e. evaluation that effectiveness of the health behaviour outweighs the costs of performing the behaviour) are thought to lead to greater intention to engage in the behaviour. Two meta-analyses lend support to the value of PMT in predicting intentions and behaviour, and they suggest that self-efficacy is identified as the strongest predictor of the construct (Floyd, Prentice-Dunn, & Rogers, 2000; Milne, Sheeran, & Orbell, 2000). These two meta-analyses evaluated studies that used a variety of health behaviours (including cancer prevention, exercise and diet, smoking cessation and AIDS prevention) as outcome measures. To date, only one published study has used PMT to predict intentions to undergo cervical screening, in 166 Scottish women, and the model was shown to predict intention but not actual screening behaviour after one year (Orbell & Sheeran, 1998).

2.1.2 The Health Belief Model.

The *Health Belief Model* (HBM) was developed in the 1950s to explain the poor uptake of preventative health services (Rosenstock, 1974). This model outlines four cognitive processes, suggesting that an individual is more likely to engage in healthy

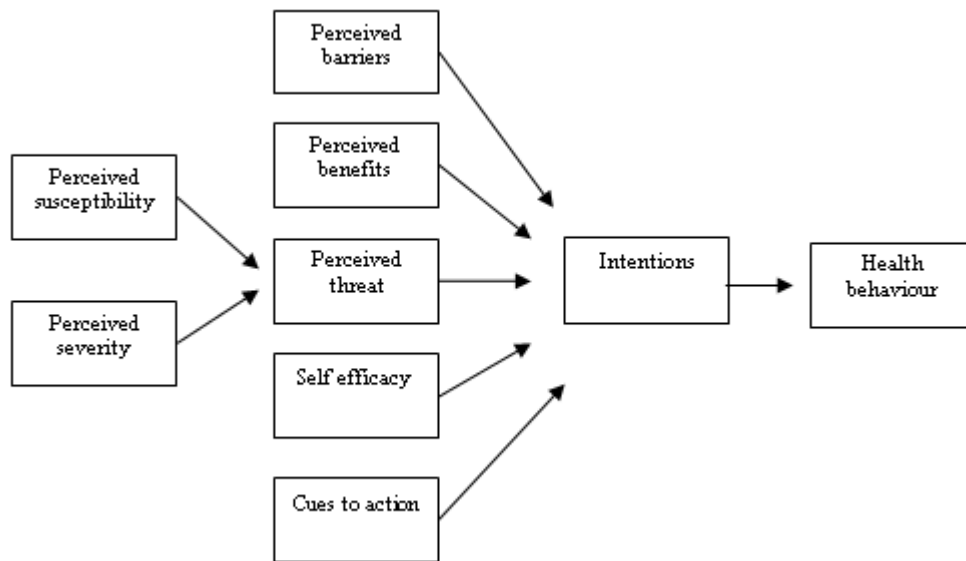


Figure 2.1. The Health Belief Model (Rosenstock, 1974).

behaviour when they perceive an illness is severe and that they are susceptible to the illness, and when there are more perceived benefits but fewer perceived barriers to carrying out the behaviour (Rosenstock, 1974). Additionally, the model suggests that certain cues to action can assist prompt behaviour, though this factor is understudied and is often not included in empirical studies (Carpenter, 2010). In some studies, self-efficacy is also included in the model (Rosenstock, 1990). Figure 2.1 outlines the components of the model. A meta-analysis of 18 studies that measured how well HBM variables predicted a variety of health behaviours suggests that the perceived barriers and benefits of healthy behaviour are the strongest predictors of the behaviour (Carpenter, 2010). However, only two of the studies used cancer screening as an outcome, whereas the other 16 studies measuring drug use, dental care, smoking cessation, condom use, influenza vaccine uptake, health program attendance, and exercise. Meta-analyses of the HBM in predicting health behaviours has identified that the model variables have weak relationships to health behaviour when prospective designs are utilised (Carpenter, 2010; Harrison, Mullen, & Green, 1992), though these studies have included a variety of health behaviours such as drug use, dental care, smoking cessation, condom use, influenza vaccine uptake, attending health programs and exercise and not cervical screening

specifically A small number of studies have used the HBM to evaluate cervical screening behaviour, with differing degrees of success. In a study of 144 English women, the model was found to only predict 4% of the variance in intention to attend cervical screening, and it failed to predict actual uptake of screening three months later (Bish, Sutton, & Golombok, 2000). However, two Australian studies showed that the HBM predicted 30% (Hill, Gardner, & Rassaby, 1985) and 27% (Hennig & Knowles, 1990) of the variance in intentions to screen. A more unusual finding is from a sample of 400 American college students where HBM predicted slightly more variance in behaviour (15%) than intention to screen (11%), with the authors concluding that the younger age of participants may account for their results (Burak & Meyer, 1997). In contrast, Murray and McMillian (1993) found perceived barriers and breast (but not cervical) cancer knowledge were the only significant predictors of screening uptake in a sample of 400 women in Northern Ireland, although the predictive value of the model was not reported.

Variation in the extent to which the HBM explains cervical cancer screening intentions and behaviour may exist due to differences in the HBM variables used in each study. For example, Bish and colleagues (2000) tested only the four core components of HBM, whereas Hill and colleagues' (1985) model also included a measure of health motivation. Additionally, differences in how variables are operationalised may impact on results. Bish and colleagues (2000) asked women to rate their intention to screen within the following three months, whereas other studies have used longer time frames. Thus, further research is warranted to clarify the utility of HBM in predicting cervical screening intentions and behaviour.

2.1.3 The Theory of Planned Behaviour.

The *Theory of Planned Behaviour* (TPB) is derived from the *Theory of Reasoned Action* (TRA), a model that tests the contribution of subjective norms and attitudes in predicting intentions and behaviour (Ajzen & Fishbein, 1980). Attitudes are beliefs about the expected outcome of performing a behaviour, whereas subjective norm relates to

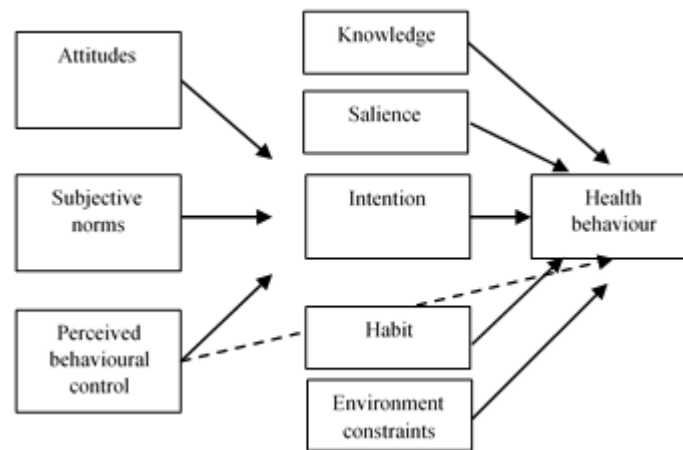


Figure 2.2. The Theory of Planned Behaviour (Ajzen, 1991) with Integrated Behavioural Model variables.

whether an individual believes that others approve of their behaviour. The TRA was later expanded to include perceived behavioural control (i.e. the extent to which an individual believes a behaviour is easy to perform) and renamed the Theory of Planned Behaviour (Ajzen, 1991). Perceived behavioural control is proposed to influence intentions as well as behaviour directly. According to the TPB, intentions are the closest determinant of behaviour, although such an assertion has little empirical support, as detailed below. The model is outlined in Figure 2.2. Typically, the predictors in the TPB can explain a considerable amount of the variance in health behaviour and intentions. An older meta-analysis of health-related behaviours has found that the TPB variables accounted for 41% of the variance in intentions and 34% of the variance in behaviour (Godin & Kok, 1996). Another meta-analysis of 185 studies had comparable findings, with the variables accounting for 39% and 27% of the variance in intentions and behaviour respectively (Armitage & Conner, 2001). However this study did not report the health behaviour outcomes used by studies analysed. Similar to the research on PMT, the meta-analyses identified that perceived behavioural control (a comparable construct to self-efficacy) was an important variable (Armitage & Conner, 2001; Godin & Kok, 1996). Relative to other models, more empirical research has evaluated the TPB in relation to cancer screening behaviour, although screening behaviour may be less successfully predicted by the model

than behaviours such as diet or exercise (McEachan, Conner, Taylor, & Lawton, 2011). However it should be acknowledged that the meta-analyses cited above were related to different types of health behaviour. Godin and Kok's review (1996) highlights that the strength of the model variables can differ based on the type of health behaviour that is measured, so comparing results between the studies may not be valid.

However, specifically relating to cervical cancer screening, a meta-analysis of eight studies utilising the TRA or TPB indicated that a moderate relationship exists between subjective norms or attitudes and intention to screen ($r=.43$ for both), which is slightly smaller than the correlation between perceived behavioural control and intentions ($r=.58$) but larger than the association between intentions and behaviour ($r=.21$) (Cooke & French, 2008). Some of the studies tested the TRA or TPB and other models, allowing for a direct comparison of the efficacy with which the model predicted cervical cancer screening. For example, Hill and colleagues (1985) compared the HBM and TRA, finding that they predicted 32% and 26% of intentions to screen, respectively, although this may be due to the greater number of predictors included in the HBM. In contrast, another study found that the TPB predicted 51% of the variance in screening intentions compared to 4% using the HBM (Bish et al., 2000), although neither model predicted uptake of screening three months later. Bish and colleagues (2000) suggest that the particularly low amount of behaviour explained by the HBM may be due to the lack of correspondence between measures of the model components and the measure of intention to screen. That is, the intention measure asked women to specifically consider their behaviour in the next 3-months, but the measures just asked the women to consider their attitudes without any reference to time anchors.

More recently, the TPB has been expanded to include additional factors to become the *Integrated Behavioural Model* (IBM). The IBM includes all of the TPB variables as well as four predictors that can influence behaviour directly rather than via intentions: knowledge, salience of the behaviour, environmental constraints and habit (Montano & Kasprzyk, 2008).

2.1.4 Limitations of the models of health behaviour.

In the literature described above, the three social-cognitive models were able to predict a greater proportion of variance in intentions to screen than the actual uptake of behaviour, and where a prospective design was used, the models often did not predict the subsequent screening behaviour. While intentions are moderately correlated with health behaviour, the models are unable to account for the reasons why an individual with high levels of intentions to screen may not end up doing so (Sheeran, 2002; Sheeran & Orbell, 2000; Webb & Sheeran, 2006). For example, Orbell and Sheeran (1998) found that while the PMT variables were able to distinguish between women who did and did not intend to screen, it could not predict whether the women with strong intentions would actually do so. This *intention-behaviour gap* highlights that a range of factors other than intentions may influence health behaviours (Sheeran, 2002). These may include practical factors such as whether the women have enough time to attend screening or can afford the cost of attending an appointment for screening.

2.2 Barriers and Facilitators to Screening Attendance

Given the small number of studies described above, it is evident that evaluation of available theories has not been a focus of the literature examining cervical screening behaviour. Despite the existence of the models of the health behaviour outlined above, much of the existing literature on factors influencing cervical cancer screening has simply investigated the *barriers* and *facilitators* to cervical screening; that is, factors that make it more difficult or easier to attend screening respectively. Although this approach does not have a theoretical basis and does not propose which mechanisms may explain how the barriers and facilitators influence behaviour, it does allow for the consideration of specific factors. For example, research using the HBM has identified that barriers to screening are important (Carpenter, 2010), although they do not generally specify what these might be. Though limited amount of research has used theoretical frameworks to enhance understanding of how barriers and facilitators may interact to influence screening

behaviour (Duffett-Leger, Letourneau, & Croll, 2008; Waller, Jackowska, Marlow, & Wardle, 2011), most studies of barriers and facilitators have instead focussed on simply documenting these factors.

A distinction has emerged between so-called *emotional* and *practical* barriers and facilitators (Eaker, Adami, & Sparén, 2001a; Waller, Bartoszek, Marlow, & Wardle, 2009). Emotional barriers are considered to be factors related to emotional states (e.g. anxiety and embarrassment) that made an individual less likely to screen. In this thesis, emotional barriers and personal attitudes and perceptions (e.g., embarrassment about the procedure or the perception the test is ineffective) were assessed together as ‘psychological’ barriers. Similarly, psychological facilitators were emotional states, attitudes, and perceptions that made an individual more likely to screen such as a fear of developing cancer or the belief that most women regularly attend screening. In contrast, practical barriers were defined as factors external to the individual that were typically related to the logistics of attending screening, such as a lack of time to schedule the doctor’s appointment or the expense of the test, whereas practical facilitators were logistical factors that were external to the individual and made an individual more likely to attend screening, such as having a GP clinic close to home or receiving a reminder letter to screen. Sometimes the distinction between practical and psychological barriers is less clear, for example, a lack of time is considered a practical barrier (Waller et al., 2009), whereas a subjective perception of time scarcity might be considered a psychological barrier. In a literature review examining factors that influence screening participation in the United Kingdom (UK), Fylan distinguishes between *health-service factors* such as failures in providing reminder letters and appointment availability, and *patient-centred factors* such as lack of knowledge about screening or a low risk perception (1998).

A summary of the key barriers and facilitators is reviewed below, which distinguishes between the different types of psychological and practical factors.

2.2.1 Psychological barriers and facilitators.

The most commonly cited psychological barriers to screening are emotional responses to the test. Embarrassment is commonly endorsed by women as a reason to avoid screening, given the intimate nature of the procedure (Armstrong, James, & Dixon-Woods, 2012; Jubelirer et al., 1996; Logan & McIlfatrick, 2011; Lovell, Wetherell, & Shepherd, 2015; Oscarsson, 2011; Waller et al., 2009; Wong, Wong, Low, Khoo, & Shuib, 2008). Anxiety about screening has also been implicated, including a fear of the procedure and receiving an abnormal test result (Eaker et al., 2001a; Jubelirer et al., 1996; Nathoo, 1988; Waller et al., 2009). Finally, distress associated with the discomfort or pain of the procedure has also been identified as a barrier (Armstrong et al., 2012; Oscarsson, Wijma, & Benzein, 2008; Waller et al., 2009).

One psychological factor that influences screening behaviour as both a barrier and a facilitator is the *perceived risk* of developing cervical cancer. Young women in particular are found to have low cervical cancer risk perception (Mather, McCaffery, & Juraskova, 2012; Sadler et al., 2013; Waller et al., 2011). A recent example of how risk perception can function as a facilitator is found in the ‘Jade Goody effect’: that is, a young celebrity’s diagnosis and subsequent death from cervical cancer which prompted an increase in screening of about 12% in the UK at the time (Casey et al., 2013). This effect was particularly prominent in young women (Marlow, Sangha, Patnick, & Waller, 2012) and those who were overdue for screening, which resulted in higher rates of referral for colposcopy (Lancucki, Sasieni, Patnick, Day, & Vessey, 2012). This indicates that Goody’s diagnosis increased the risk perception of women who may have previously felt that cervical cancer was not a disease that affected young women. Unfortunately, this effect was shown to be short-lived, with rates of cervical screening returning to within normal levels a short time later (Lancucki et al., 2012).

Underpinning several of the psychological barriers and facilitators is a woman’s knowledge about cervical cancer and screening. If a woman has limited knowledge of

cervical cancer and screening, it is unlikely she will form an accurate perception or be able to accurately evaluate the costs and benefits of screening. It is possible that part of the 'Jade Goody effect' was that the media coverage increased the women's knowledge about the purpose of screening and when they should attend. Importantly, a consistent finding in this field is that women's knowledge about the purpose and efficacy of screening is poor (Larsen & Olesen, 1998; Mather et al., 2012; Neilson & Jones, 1998; Philips, Johnson, Avis, & Whynes, 2003; Sadler et al., 2013; Siahpush & Singh, 2002), perhaps because the causal link between HPV and cervical cancer is often not known (Ashok, Berkowitz, Hawkins, Tangka, & Saraiya, 2012; Sadler et al., 2013). Even amongst medical students, only about half of them were aware of this relationship (McCusker et al., 2013). However, a study of women in the UK found that younger women's perceived risk of developing cervical cancer increased when they were presented with information about HPV, although the impact on their screening intentions and behaviour is unknown (Marlow, Waller, & Wardle, 2009).

Another specific knowledge gap in women is their poor awareness of screening guidelines. This is a particular problem in Australia, since current guidelines for screening are convoluted (see Section 1.1.4). Mather and colleagues (2012) used a multiple choice knowledge test that showed that among university-educated Australian women, 52% knew that the Pap test should be performed every two years but less than 5% could identify when they should first have a Pap test. Pertinently, if young women do not know they should already be attending screening, then it is unsurprising that their screening rates are low.

Poor screening knowledge may exert a more indirect impact on screening attendance. For example, some women believe that if they have no gynaecological symptoms, the test is unnecessary (Oscarsson et al., 2008). In addition, the belief that the test is used to diagnose cancer has been identified as a barrier to screening (Lovell et al., 2015; Sadler et al., 2013), likely due to anxiety about being diagnosed with cancer or the belief that the test is unnecessary because they are not at risk of developing cervical

cancer. This is particularly relevant to young women, since pre-cancerous changes are highly prevalent in this age group whereas cervical cancer is not. Thus, young women may screen in higher rates if they are aware that screening can detect pre-cancerous changes that are treatable and rarely result in cancer development.

Some women may make a deliberate choice not to attend screening (Ackerson & Preston, 2009; Blomberg, Ternestedt, Tornberg, & Tishelman, 2008). Blomberg and colleagues (2008) conducted a qualitative study and identified that such women may choose not participate in screening because they believe the test is effective, self-monitoring is more effective or that they have a low risk of developing cervical cancer or they had prior negative experiences with health care. Similarly, Ackerson and Preston (2009) conducted a systematic review and found that the women who chose not to undergo cervical screening feared the medical examination or health professionals or they did not have or want knowledge about their own cancer risk.

2.2.2 Practical barriers and facilitators.

In contrast to psychological factors, practical factors are external or logistical factors that are associated with attending screening. In particular, a women's lack of time, competing demands on her time or finding it difficult to make an appointment are commonly cited as reasons for not screening in a timely manner (Logan & McIlfatrick, 2011; Oscarsson et al., 2008; Waller et al., 2011). Attending screening comes at a time cost (Shireman, Tsevat, & Goldie, 2001), and changes in the family structure and women's participation in the workforce may contribute to time pressure being a more significant factor in maintaining health behaviours (Strazdins et al., 2011). Women often report competing demands such as family commitments, and that these are prioritised over which are prioritised over a woman's own health needs (Oscarsson et al., 2008; Waller et al., 2009, 2011). There is preliminary evidence that practical barriers are more commonly cited by young women (Waller et al., 2011), and those in lower socioeconomic status (SES) groups (Logan & McIlfatrick, 2011), although such an assertion has not

been tested with a control group.

Women also often endorse facilitators to cervical screening such as opportunistic screening (i.e. having a doctor conduct the procedure while attending a consultation for another purpose), flexible appointment times (Logan & McIlfatrick, 2011; Waller et al., 2011) and easier access to health providers (Black, McCulloch, Martin, & Kan, 2011). Prompts to screen are the most commonly investigated practical facilitator in the context of interventions to promote screening (Albrow et al., 2014).

Importantly, it is possible that these factors may help bridge the intention-behaviour gap since some women may be highly motivated to attend screening, but do not do so because they have difficulty in attending an appointment for the reasons outlined above. For example, Sheeran and Orbell (2000) found that asking women to write down when, where and how they would make an appointment to attend screening was related to increased screening rates in the following three months. Thus, helping women to prioritise and plan their screening attendance may result in increased screening rates.

2.2.3 Are psychological or practical barriers more important?

It is not clear which of the above psychological and practical factors are most important to address in order to increase screening rates. If women do not screen because of the unpleasant emotions experienced in response to the procedure, reducing the costs of screening will not improve screening rates. Similarly, if women do not screen because they cannot readily access medical clinics, trying to persuade women of their susceptibility to cervical cancer will be ineffective.

A recent Cochrane review of 38 randomised controlled trials concluded that invitations to screen were more effective than education interventions (Everett et al., 2011), which suggests that although knowledge deficits are widespread, this may not need to be targeted in psychological interventions. Similar conclusions have been found in reviews of interventions, suggesting that an individualised prompt such as a reminder

system and physician recommendation has stronger empirical support than a more general approach such as a mass media educational campaign (Brouwers et al., 2011; Marcus & Crane, 1998; Yabroff, Mangan, & Mandelblatt, 2003).

Further evidence comes from a study of barriers to screening, reported by 580 women in the UK. The most commonly endorsed barriers amongst those who were both up to date and overdue for screening were emotional (embarrassment, fear of pain and fear of detecting cancer) (Waller et al., 2009). However, the barriers that most strongly predicted whether women were overdue for screening were practical, such as difficulties making an appointment or not getting around to making an appointment (Waller et al., 2009). Similarly, Eaker and colleagues (2001a) found that women who reported a lack of time as a screening barrier had smaller odds of screening, whereas anxiety about screening was not significantly associated with its uptake. In addition to suggesting that practical barriers may be especially important to address, these studies reveal a discrepancy between barriers and facilitators reported as being most important and those associated with screening behaviour. Given much of the existing literature in the study of barriers and facilitators is qualitative, there is a need to test these assertions in larger quantitative studies.

2.3 Demographic Factors Associated with Screening Attendance

Though there is a considerable body of research investigating barriers and facilitators to screening, the majority of the research on cervical screening attendance has studied only the demographic factors to identify underscreened groups. Consistently, these have reported that screening rates are lower among women who are: aged 30 years or less (Lancucki et al., 2010; Siahpush & Singh, 2002; Smith et al., 2011); over 50 years (Olesen, Butterworth, Jacomb, & Tait, 2012); women who are migrants or members of an ethnic minority (C. Johnson, Mues, Mayne, & Kiblawi, 2008); of low SES (Hawkins, Cooper, Saraiya, Gelb, & Polonec, 2011; Olesen et al., 2012); less educated (Ashok et al., 2012; Hawkins et al., 2011; Siahpush & Singh, 2002); childless (Olesen et al., 2012);

Oussaid, Lutringer-Magnin, Barone, Haesebaert, & Lasset, 2013) or have a history of interpersonal trauma (Farley, Golding, & Minkoff, 2002; Olesen et al., 2012). Women without a spouse or partner are also less likely to screen (Olesen et al., 2012), which may in part account for the younger women's lower screening rates. In particular, there is a large body of research examining the screening behaviour of women from ethnic minority groups, which identifies the unique challenges the women may face, including knowledge deficits and language barriers, highlighting the potentially modifiable points of intervention in these cohorts (C. Johnson et al., 2008; Kwok, White, & Roydhouse, 2011). However, although age-related variations in screening rates are reported, little prior research has investigated *why* a woman's age influences her screening behaviour, so as to inform the development interventions to target younger and older women who are known to screen at lower rates.

2.4 Health Factors Associated With Screening Attendance

A number of health factors have been consistently found to be associated with increased screening behaviour. The factors include greater health service use (Ashok et al., 2012; Kristensson, Sander, Euler-Chelpin, & Lynge, 2014; Olesen et al., 2012), having a regular health care provider (Ashok et al., 2012; Mandelblatt et al., 1999; Maxwell, Bancej, Snider, & Vik, 2001), good self-rated health (Olesen et al., 2012), and the absence of mental health problems (Nelson, Moser, Gaffey, & Waldron, 2009; Olesen et al., 2012).

In contrast, some health related factors that are associated with a greater risk of developing cervical cancer are also associated with lower screening rates, including smoking, (Nelson et al., 2009; Olesen et al., 2012; A. Smith et al., 2011) and being at a higher body weight (Cohen et al., 2008; Nelson et al., 2009; Olesen et al., 2012). However, women who are sexually active or have a history of sexually transmitted infections are more likely to attend screening, likely due to their engagement with a doctor who is prescribing contraceptives and providing sexual health care (Oussaid et al.,

2013; A. Smith et al., 2011). In summary, women with better health and those who are more engaged with health care are generally more likely to attend screening. This is not surprising given that cervical screening often occurs in the primary health care setting, and that physician recommendation is a strong predictor of screening (Nguyen & McPhee, 2003). This highlights that women with known risk factors for cervical cancer are less likely to engage with screening programs.

2.4.1 HPV vaccination.

A specific health factor related to cervical cancer screening is HPV vaccination receipt. With the recent introduction of HPV vaccination in many countries, a question that has received a lot of research attention is whether women who are vaccinated against HPV are less likely to attend cervical screening in future. Recent research indicates that those who have been vaccinated indeed have greater protection against cervical cancer, and it is intuitive that they would therefore be less likely to prioritise screening. Though the decline in screening amongst young women identified in Lancucki and colleagues' study (2010) occurred prior to the introduction of the HPV vaccine (1995–2005), this could be a factor which has exacerbated age-related differences in screening behaviour as the vaccine is generally targeted at adolescents and young women.

Reassuringly, a growing body of evidence investigating the impact of HPV vaccination on health behaviour suggests that there is a positive association between vaccination receipt and future screening behaviour (Chao et al., 2016; Herweijer et al., 2015; Kliwer, Mahmud, Demers, & Lambert, 2013; Kuitto, Pickel, Neumann, Jahn, & Metelmann, 2010; Sauer, Jemal, Simard, & Fedewa, 2015; Steens et al., 2013), likely reflecting that greater engagement with preventative health care increases the likelihood of vaccination as well as screening. The initial studies only measured attitudes and intentions to screen rather than screening behaviour (Mather et al., 2012), although this has now been confirmed in larger studies linking screening registry data with vaccination records (Kliwer et al., 2013). This finding highlights a particular concern, that the

women who are at greatest risk for cervical cancer due to being unvaccinated are at further risk of developing the disease, as they are less likely to attend cervical screening.

In contrast, one Australian study that utilised linkage between the Victorian cervical screening registry and HPV vaccine registry found that women who had received the vaccine were less likely to attend subsequent screening than unvaccinated women (Budd et al., 2014). The reasons for this discrepancy are unclear given the rigorous methodology in the study, which obtained data from 2.7 million women. Thus, further investigation is required, particularly in the Australian context.

2.5 Cervical Cancer Screening in Young Women

As outlined in Chapter 1, the key research question in this thesis is why younger women are less likely to attend cervical screening, as there is limited research addressing this question. All relevant studies that could be identified are summarised in Table 2.1. It has been suggested that one reason for the paucity of research in this area in recent years is that the cervical cancer prevention literature has tended to focus on the promotion of the HPV vaccination to young women (Blomberg, Widmark, Ternstedt, Törnberg, & Tishelman, 2011).

The importance of understanding the age-related reasons for not attending screening was highlighted in one study using a sample of 965 women from the UK who were asked about their perceived susceptibility to cervical cancer (Marlow et al., 2009). For women aged 16–24 years, their risk perception increased after receiving information about the prevalence and transmission of HPV and the role of the virus in causing cervical cancer. In contrast, risk perceptions decreased in older women (> 65 years of age), which is an age group more likely to be diagnosed with cervical cancer but at less risk of contracting HPV. Similarly, another study found that age mediated the effects of their tested intervention, with the authors concluding that such interventions should be tailored to specific age groups (Luszczynska, Goc, Scholz, Kowalska, & Knoll, 2011). These findings suggest that interventions may be ineffective or even counter-productive if they

are not relevant to the target age group. Furthermore, health promotion programs that seek to target women across the 50-year age range of screening are likely to be ineffective.

In one qualitative study of young Canadian women aged 20–24 years, health service factors were found to be strongly implicated. In particular, many women did not have a regular health care provider or they struggled to find a female provider, and this was identified as a key barrier to being screened (Black et al., 2011). In contrast, 31 English women aged 17–25 years who participated in focus groups reported that their barriers to screening were poor awareness of the screening and its purpose, low perceived risk of developing cervical cancer, low prioritisation of the screening and a generally negative attitude towards screening. Further, the women suggested that material promoting screening to young women should be factual but not overly medical, should elucidate the link between the HPV vaccine and cervical screening, and emphasise that the test does not diagnose cancer (Sadler et al., 2013). Similarly, a survey of Canadian women aged 18–25 identified that the strongest facilitators to attending screening were high perceived behavioural control, positive social norms towards screening and being aware of cervical screening from a young age (Duffett-Leger et al., 2008). However, it should be noted that these three studies only sampled women aged 25 years and under, an age group in which screening is currently being phased out. Thus, this age group is not studied in the research presented in this thesis, as discussed in Section 1.1.5.

Blomberg and colleagues have published two qualitative studies investigating women's attitudes to screening in Swedish women aged 30 years. One of the studies explored the views of 38 women as to how their age had influenced their screening behaviour (Blomberg, Widmark, Ternstedt, Törnberg, & Tishelman, 2011). The study identified that women of this age felt that they were in transition between youth and adulthood, and that cancer prevention was not a part of this life stage. In a larger related study, 138 women were interviewed to identify facilitators to participation in the national screening program (Blomberg et al., 2011). This details a large number of changes suggested by the women in relation to the information that should be provided in the

invitation letter, and that screening should be personalised to suit the individual woman's needs.

In another study, Malaysian university students aged 18–30 years were interviewed, finding that the most significant barrier to screening was worry about the test (Al-Naggar, Low, & Isa, 2010). In this study, psychological barriers were most commonly endorsed, such as fear of pain, embarrassment and concern the test would result in loss of virginity. However, in this study, only 6% of the women sampled had ever had a Pap test, markedly lower than Australian rates (Al-Naggar et al., 2010). In contrast, a study of 430 women in the UK aged 25–35 years identified that knowledge gaps were most important, specifically, believing the test was used to diagnose cancer and being unaware of when screening was required (Lovell et al., 2015).

Only one study has compared younger and older women's attitudes, to identify the discrepancies which may explain their different screening rates. This qualitative study identified that young women in the UK were more likely to endorse practical barriers to screening such as competing demands on their time, with older women more likely to cite psychological barriers such as not feeling at risk of developing cervical cancer (Waller et al., 2011). However, there were few older participants in the study, so the findings require confirmation in a larger study.

In summary, these studies discuss a range of different barriers and facilitators including knowledge gaps, low perceived risk, practical barriers and health service issues. In particular, health service engagement was consistently found to facilitate screening. This may be an important factor given that relative to older women, younger women are less likely to have a regular primary health care provider (Australian Bureau of Statistics [ABS], 2015; Henderson & Weisman, 2005) as well as having better general health (ABS, 2013), although less is known about how health service factors influence screening in the Australian context.

Table 2.1

Literature examining the factors which influence young women's cervical screening attendance.

Author, year and country	Study aim	Sample	Methodology	Results
Al-Naggar et al., 2010 <i>Malaysia</i>	To examine level of knowledge and barriers towards screening	287 Malaysian university students aged 18-30	Cross-sectional survey (quantitative)	Most women had adequate knowledge <i>Barriers</i> - Worry about test results - Lack of physician recommendation
Black et al., 2011 <i>Canada</i>	To examine knowledge, barriers and facilitators	80 Canadian women aged 20-29	Analysis of data from focus groups (qualitative)	<i>Barriers</i> - Difficulty finding health care provider - Invasiveness of test <i>Facilitators</i> - Assistance with finding health care provider - Female practitioner - Education about test
Blomberg et al., 2011 <i>Sweden</i>	To explore reasoning about health and disease prevention, in relation to cervical cancer and screening	38 Swedish women aged 30	Analysis of data from focus groups (qualitative)	Women in this age group felt they were in between youth and adulthood. <i>Barriers</i> - Cancer and other diseases considered a distal threat - Lack of information about screening
Blomberg et al., 2011 <i>Sweden</i>	To investigate facilitators to screening	138 Swedish women aged 30	Analysis of data from focus groups (qualitative)	<i>Facilitators</i> - Individualising the screening process - Making explicit link between HPV and cancer

Duffett-Leger et al., 2008 <i>Canada</i>	To assess predictors of intention to screen using TPB framework	904 Canadian women aged 18-25	Cross-sectional survey (quantitative)	<i>Predictors of intention to screen</i> - Social norms - Perceived behavioural control
Lovell et al., 2015 <i>United States</i>	To identify barriers to screening in young women	430 women aged 25-35	Cross-sectional survey (quantitative)	<i>Barriers</i> - Being unaware of screening guidelines - Believing test is for cancer
Marlow et al., 2009 <i>United Kingdom</i>	To test whether providing HPV information has a differential effect on cervical cancer risk perception based on age	965 UK women aged 16-75 who had not previously heard of HPV	Experimental repeated measures (quantitative)	When presented with HPV information: - Older women's perceived risk lowered - Young women's perceived risk increased.
Sadler et al., 2013 <i>United Kingdom</i>	To identify attitudes to screening to inform development of pre-notification leaflet for screening invitations, using the trans-theoretical model as a framework	31 women aged 17-25 attending Manchester medical clinic	Analysis of data from focus groups (qualitative)	<i>Attitudes to screening</i> - Low awareness of screening and its purpose - Information came from friends/family - Screening was viewed negatively - Perceived risk was low - Low awareness of HPV-cancer link - Screening was of low priority - Leaflet should connect HPV vaccine and screening and focus on pre-cancerous changes
Waller et al., 2012 <i>United Kingdom</i>	To explore age related differences in barriers to screening	46 women aged 25-59 who did not attend screening regularly	Analysis of data from individual interviews and focus groups (qualitative)	<i>Barriers to screening</i> - Younger women more likely to intend to screen but cite practical barriers. - Older women more likely to have negative attitudes and not intend to screen

2.6 Women's First Screening Attendance

One research area that has received almost no attention in the literature is possible differences between women who have not screened before and the women who have previously had this procedure (Chorley, Marlow, Forster, Haddrell, & Waller, 2016). This question may be of particular relevance in identifying why young women are less likely to screen, as this is the age (18–25 years) when women start to screen, depending on the recommendations in their country. Women who have not had the test before may have different needs to other women because they do not necessarily know what to expect from the procedure. In addition, nulliparous young women may not have had any intimate procedure before. Australian women may not be aware that they require screening, as it is only after they first attend screening that they will receive a reminder letter (AIHW, 2016).

Only one study was identified that aimed to explore the barriers to screening in women who had not previously attended, in a qualitative study of 20 Malaysian women aged 18 to 56 years (Wong et al., 2008). This identified that psychological barriers such as poor knowledge and negative attitudes to cancer screening were key barriers in this group. However, the novice screeners were not compared to women who had screened before, so it was unclear whether the factors were unique to women who hadn't screened. Additionally, it is unclear whether these barriers were relevant to Australian women. Similarly, a study of young Malaysian women described above, where 94% of the sample were women who had never screened before, found that worry and knowledge gaps were key barriers to screening (Al-Naggar et al., 2010). Orbell and Sheeran also sampled women who had never attended screening, however the aim of the study was to evaluate whether Protection Motivation Theory was able to predict their screening behaviour (1998). Finally, several studies have referred to women's first screening experience in passing, noting that the women's first screening experience may be more difficult (Waller et al., 2011), or that the women who had not screened previously may require additional support to attend (Blomberg et al., 2011; Yabroff et al., 2003). However, this was not a focus of any study and was not discussed in any detail beyond this.

Thus, there is a lack of clarity as to whether the factors related to women's first screening attendance are different to the women who have had the test previously. Given that past behaviour is a strong predictor of future health behaviour (Ouellette & Wood, 1998), if women are enabled to have the test for the first time, they are may be more likely to screen in future.

2.7 Summary and Limitations of Existing Literature

A small number of older studies have used social-cognitive theories to better understand the factors that can influence screening intentions and behaviour in women, although the literature on cervical screening has tended to focus only on barriers and facilitators to screening. In addition, there is a considerable amount of literature examining demographic factors, with younger age shown to be associated with lower screening rates. However, this research has not yet identified the reasons why age is a determinant of cervical screening uptake.

Thus, it is clear that better understanding the age differences in screening barriers and facilitators is important when designing interventions to promote cervical screening. In two studies it was found that age altered the efficacy of the interventions to promote screening (Luszczynska et al., 2011; Marlow et al., 2009), and this may explain why reviews of interventions to promote screening have found that individualised approaches are better than general approaches (Everett et al., 2011; Marcus & Crane, 1998; Yabroff et al., 2003).

Additionally, there is some evidence that practical barriers and facilitators are more important than psychological factors, especially for young women, although few studies have used quantitative methodologies to identify which barriers and facilitators are most important in addressing screening. This also warrants investigation in the Australian context given many practical barriers are dependent on the health service within which screening occurs, and this service provision may differ considerably between countries. Another factor that is relevant to young women's screening attendance

is that no research to date has examined whether women's first screening experience is different to the subsequent ones, and whether different interventions are required to promote screening in women who have never screened before.

Finally, with regards to theoretical models, this area has been understudied in recent years. While there is a small body of research supporting the use of the TPB in better understanding cervical cancer screening intentions, it is not known whether the more recent IBM variables are a useful addition to this. Further, more research is also required to understand why the HBM has had variable success in explaining women's cervical screening behaviour, and whether age-related factors may influence this success.

2.8 Specific Study Aims, Research Questions and Hypotheses

The research presented in this thesis aims to address significant gaps in the literature described in the previous section by exploring the factors influencing cervical screening attendance in young Australian women. Three planned studies will seek to better understand whether the factors that likely influence screening are different in women who have not previously screened and those who have screened before. Finally, the TPB and HBM were chosen as theoretical frameworks to help better understand young and older women's cervical cancer screening intentions and behaviour. Three broad research questions were examined across the three studies:

1. Which screening barriers and facilitators most strongly influence cervical screening behaviour in young women?
2. Do the screening barriers and facilitators differ between women who have never screened and those who have previously screened?
3. Do social-cognitive models of health behaviour provide a better account of factors influencing screening behaviour than analysis of barriers and facilitators?

The specific research questions and hypotheses for each of the three studies are outlined below:

2.8.1 Study 1.

Results from this study are presented in Chapter 4. The aim of this qualitative study of 20 women was to explore young Australian's women's screening experiences and the barriers and facilitators to screening they encountered, guided by the following research questions:

1. What are the young women's experiences of cervical screening?
2. Which screening barriers and facilitators most strongly influence cervical screening behaviour in young women?
3. How do the screening barriers and facilitators differ between the women who have previously screened and those who have?

As this was an exploratory qualitative study, no study hypotheses were tested.

2.8.2 Study 2.

Results from this study are presented in Chapter 5. Using survey data from 338 Australian women, the aim of this study was to test the findings obtained from Study 1 in a quantitative study, to evaluate the extent to which the barriers and facilitators nominated by women were associated with their actual screening behaviour. Research questions were:

1. Are psychological or practical screening factors better predictors of women's screening behaviour?
2. Do the screening barriers and facilitators differ between younger and older women, the women who have not previously screened and those who have a regular GP?

Based on the past literature, it was hypothesised that:

1. Number of practical barriers and facilitators nominated by the women will be a stronger predictor of being overdue for screening than the number of psychological barriers nominated by the women.
2. Younger women will report a greater number of practical screening barriers and facilitators than the older women.
3. Women who had not attended screening will nominate more psychological barriers and facilitators to screening than the women who had previously screened.
4. Women who have a regular GP will be more likely to have ever attended screening, and will be less likely to be overdue for screening, relative to women who do not report having a regular GP.

2.8.3 Study 3.

The results of this study are presented in Chapter 6. The aim of this study was to compare the TPB and HBM in predicting cervical cancer screening intentions and behaviour, using data from the 338 participants who completed Study 2. The research questions included:

1. Is the TPB or the HBM a better predictor of women's cervical screening intentions and behaviour?
2. Are the IBM variables significant predictors of women's screening behaviour?
3. Do the results differ between younger and older women, and between those who have screened and not screened previously?

Based on the past literature, it was hypothesised that:

1. The TPB will be a stronger predictor of women's cervical screening intentions and behaviour than the HBM.

2. The IBM variables will be significant additional predictors of screening behaviour when added to the TPB model.

3. Methodology

In the previous chapter, research questions and hypotheses for three studies were outlined. The specific qualitative and quantitative methods used in the studies are described in Chapters 4, 5 and 6. This chapter includes an outline of the methodological framework, a mixed methods approach, specifically a sequential exploratory design, that provided a framework for Studies 1 and 2 to explore women's barriers and facilitators to screening. Study 3 was a standalone quantitative study, though its development was influenced by findings from Study 1. Mixed methods design, which is more than simply using both qualitative and quantitative methods, involves utilising a pragmatic philosophical approach to scientific design of the thesis as a whole. The reasons for choosing a mixed methods approach and a sequential exploratory design are outlined below, prior to introducing the mixed methods research questions for the thesis.

3.1 The Mixed Methods Approach

Traditionally, qualitative and quantitative methodologies have been considered the two dominant and opposing research approaches. However in recent years, mixed methods research has emerged as a third approach, where both qualitative and quantitative methods are used in a study or program of research (Tashakkori & Teddlie, 2010). The mixed methods approach does not just entail the methods used in research, but the philosophical or methodological approach taken (Creswell & Plano Clark, 2011). The philosophical approach associated with the mixed methods approach is pragmatism, which rejects dualisms (such as qualitative vs quantitative, or subjective vs objective) to seek the most practical solution to the problem at hand. In the context of mixed methods research, this means combining a range of qualitative and quantitative methods to use the strengths of each methodological approach and minimise their weaknesses (Feilzer, 2010). Additionally, comparing results from different methodologies can be triangulated to strengthen the validity of findings (Andrew & Halcomb, 2006)

Definitions of mixed methods research vary. Johnson and colleagues (2007) asked 21 leaders in the field of mixed methods research to define the methodology, which elicited a varied response. Mixed methods research may entail a program of work with sequential studies using different methodologies, or a take a concurrent approach where both qualitative and quantitative data are collected at the same time. Additionally, there can be variation in how much weighting a particular approach is given over the other (Johnson & Onwuegbuzie, 2004). Though mixed methods research can have a greater burden with regards to resources, time and skills, the approach has a number of advantages such as informing the development of subsequent studies, corroborating results or expanding on significant findings (Greene, Caracelli, & Graham, 1989).

3.2 Rationale for Using a Mixed Methods Approach

This thesis explores barriers and facilitators to cervical cancer screening among young Australian women. With the lack of quantitative studies exploring young women and cervical screening, a key aim of the research presented in this thesis was to generate quantitative evidence to add to the literature on barriers and facilitators to screening for this population. However, there were a number of reasons why preceding this with a qualitative study would be beneficial. The lack of past quantitative studies also meant there were no validated measures of barriers and facilitators to screening, and a lack of guidance to inform the data analysis to be used in the quantitative study. Additionally, while a small number of qualitative studies have studied young women's screening barriers and facilitators, none of these have been conducted in the Australian context, and so it is not clear whether practical barriers relating to health services are relevant in this setting. Exploring experiences of screening and factors influencing screening attendance in this setting could be used to enhance and inform the development, analysis and interpretation of the quantitative study. Finally, as no study to date has compared women's experiences of their first and subsequent screening attendance, a qualitative study would allow for in-depth exploration of this topic and generate findings that could then be evaluated quantitatively.

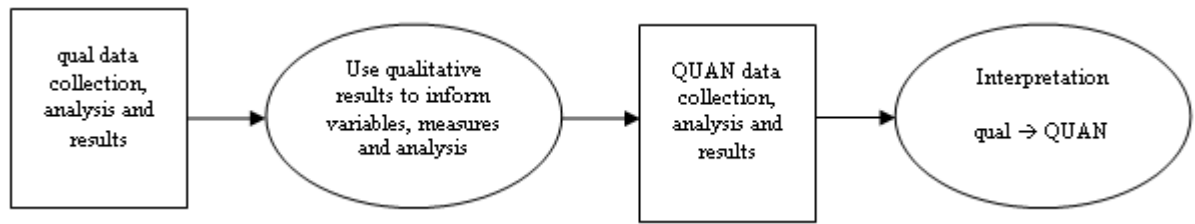


Figure 3.1. Mixed methods study design.

Thus, there is a need in the literature for collecting both empirical quantitative and qualitative data on women's experiences of cervical cancer screening. An approach grounded in pragmatism was also considered appropriate for this thesis which explored the intersection of individual psychology and public health. Currently research on young women's barriers and facilitators to screening is inconsistent, and resolving these discrepancies is problematic when comparing findings from different countries with different health service settings. Hence, conducting two studies in the same setting allows for triangulation of two sets of findings in the Australian population and an opportunity to consider health promotion strategies appropriate for this context.

3.3 Mixed Methods Design

In Studies 1 and 2, a two phase sequential exploratory approach was used to understand barriers and facilitators to screening for young women. Conducting the phases sequentially meant that findings from the first study could inform the development of the second. Although exploratory designs normally place greater emphasis on qualitative results (Creswell & Plano Clark, 2011), in this thesis the quantitative component was given more emphasis in the study design. Study 1 and 2 focussed on establishing the key perceived barriers and facilitators to screening among women and testing the strengths of associations between these factors. As outlined in Figure 3.1, a qualitative study was conducted to explore women's experiences of screening and the barriers and facilitators they experienced. The findings from Study 1 were then used to inform the development, and analysis, of the variables in Study 2. Study 2 then assessed the strengths of associations between screening barriers and facilitators, and screening behaviour.

3.4 Mixed Methods Research Questions

Creswell suggests that in addition to research questions relating to the qualitative and quantitative investigations, research questions relating to the purpose of the mixed methods framework are important. These additional questions explain how the two methodologies integrate with one another, and make clear the purpose of using a mixed methods design (Creswell, 2014). Hence, in addition to the specific research questions outlined the previous chapter, the following mixed methods research questions were used to inform the mixed methods elements of the thesis:

1. How do the results from the qualitative study (Study 1) inform the development of the quantitative study (Study 2)?
2. To what extent do the quantitative results (Study 2) confirm the qualitative results (Study 1)?

After the results from the qualitative study (Study 1) are presented, the way these results informed the development of the quantitative study (Study 2) is discussed in Chapter 5. The extent to which the quantitative and qualitative results converge are then discussed in the General Discussion (Chapter 7).

4. Study One

In this chapter, results from the qualitative study (Study 1) are presented. These results were presented at the European Research Organisation for Genital Infection and Neoplasia Congress in Salzburg, Austria, on 15 June 2016.

4.1 Introduction

As discussed in Chapter 2, substantial literature has explored factors related to screening non-attendance including demographics (e.g. socioeconomic and ethnic minority status) (C. Johnson et al., 2008; Pruitt, Shim, Mullen, Vernon, & Amick, 2009). However, little is known about how age can impact on screening behaviour. It is known that women in developed countries who are aged <30-years or >50-years have lower rates of cervical screening (Lancucki et al., 2010; Olesen et al., 2012; Siahpush & Singh, 2002; Smith et al., 2011), and the rate of screening in women aged <30-years has fallen recently in developed countries (Lancucki et al., 2010). Most prior studies have examined only heterogeneous samples of younger and older women (Ashok et al., 2012; Hawkins et al., 2011; Oussaid et al., 2013). One qualitative study from the UK suggests that practical barriers to screening (e.g. finding the time to screen) are more important to young women than psychological barriers (e.g. worry) (Waller et al., 2009). Yet, it is not known whether barriers and facilitators differ for women's first experience with cervical screening.

In 2017, the Australian NCSP will move from the prescription of biannual Pap tests to a new program of five-yearly HPV testing in women, starting at age 25 years. With decreasing cervical screening rates, especially among young women, it is an opportune time to examine women's experiences and behaviours related to screening. Providing in-depth information about young women's experiences of the current screening program, Study 1 elucidates areas of need for health promotion and clinical care as Australia moves to a new era of cervical screening. The specific aims of Study 1 were to use qualitative methods to investigate:

1. What are the young women's experiences of cervical screening?
2. Which screening barriers and facilitators most strongly influence cervical screening behaviour in young women?
3. How do the screening barriers and facilitators differ between the women who have previously screened and those who have?

4.2 Methods

4.2.1 Participants.

The ethical aspects of Study 1 were approved by the Australian National University (ANU) Human Research Ethics Committee (Approval number: 2013/643). Women less than 25-years of age were excluded from the study as cervical screening in this age group will cease in 2017 in Australia. Twenty women aged 25–35 years who were fluent in English and lived in the Canberra, Australia, region were recruited via posters displayed at the ANU campus and in other public areas (e.g. shopping centres and public bathrooms), and using snowballing recruitment. This method of sampling involves study participants telling their friends, family or colleagues to consider participating in the study. It has the advantage of locating participants from a specific or hidden population group in an efficient way. However, the people recruited in this way may share the same characteristics with the participants who referred them, thus, it can lead to biases compared to a random recruitment approach (Heckerthorn, 1997). Women who were regular screeners, those who had previously screened but were overdue for screening, and those who had not previously undertaken cervical screening were recruited to the study. The first ten women recruited were regular screeners. Thus, later recruitment was restricted to only those women who had either never been screened or had previously screened but not in the past three years. These women were recruited using an updated and more specific recruitment poster. The median age of the women was 28.5 years. The sample was well educated such that all women held at least a diploma or undergraduate or postgraduate degree.

4.2.2 Procedure.

Individual interviews were conducted between October 2014 and May 2015 in a location chosen by the individual participants (e.g. café or workplace). Interviews were chosen over focus groups due to the personal nature of the interview questions. Each interview took 20 to 40 minutes to complete. After providing informed consent to participate in the study, the women were first asked a series of closed-ended questions related to demographics and cervical screening knowledge. This was followed by open-ended questions (with additional prompts if necessary) related to the women's personal experiences of cervical screening and the barriers and facilitators they encountered to that screening. At the completion of the interview, participants were able to choose to receive either a \$20 gift voucher or movie ticket to thank them for their participation. Interviews were recorded using a digital recording device, then transcribed verbatim and analysed using ATLAS.ti (Muhr & Frieze, 2004).

4.2.3 Interview schedule.

The semi-structured interview schedule was informed by findings in the existing literature and the primary research questions. Prior to commencing Study 1, the interview questions and procedure was piloted on four female post-graduate students at ANU to assess their clarity, comprehensiveness and relevance. The interviews were conducted in full, following the same procedure as the study participants. However, at the end of this, the pilot participants were asked to provide feedback on the interview schedule. The schedule was revised based on the feedback they provided. Newly added questions were: "Have you heard of a Pap test?", "Do you know if women still need to have Pap tests after having the HPV vaccine?" and "What is it like getting a Pap test?" Additionally, a definition of cervical screening was provided because one student did not know what cervical screening entailed. Questions related to knowledge about screening, prior experiences of screening as well as asking women to discuss barriers and facilitators relating to screening. During the interview, follow-up prompts and questions were used to

elucidate the meaning and context of participant responses, as was required.

4.2.4 Analysis.

Interviews were transcribed by one researcher (TM). The audio files were deleted after transcription in accordance with ethical requirements. Data collection and analysis were conducted concurrently. Thematic analysis was used to identify the codes in each transcript. Thematic analysis is a flexible method of identifying, analysing and reporting patterns within qualitative data (Braun & Clarke, 2006; Rice & Ezzy, 1999). The patterns capture important and meaningful aspects of the data, and do not have to be driven by theory. The aim of our thematic analysis was to provide a rich description of the data as a whole, rather than providing a detailed account of one particular theme. Our analysis followed the guidelines set out by Braun and Clarke (2006) for conducting and reporting thematic analysis within psychological research. The researcher (TM) immersed herself in the data through repeated readings of the transcripts. Initial coding was guided by the primary research questions and key findings in the prior relevant literature, including the prior identification of practical and psychological screening barriers. A large number of codes were initially generated (with many later condensed or deleted), to minimise the exclusion of potentially important codes. Codes were then sorted into overarching themes with the assistance of a second researcher (AO). Specific experiences in each category were then compared and contrasted, and during this process, new themes (e.g. normalisation of screening) emerged. After each new theme was identified, the transcripts were re-read and re-coded. The write-up presented below provides an analytic narrative of the themes identified in the data, with particularly vivid or essential quotations used to illustrate the themes. Pseudonyms are used.

4.3 Results

Demographic characteristics of the sample are shown in Table 4.1. Ten of the 20 women had attended cervical screening in the past 3-years, four were overdue for screening but had intended to screen in the future, two were overdue for screening but had

Table 4.1

Demographic characteristics of the sample.

Pseudonym	Age	Education level	Relationship status	Regular GP
<i>Regular screeners</i>				
Anne	29	Postgraduate	In a relationship	Yes
Bianca	26	Undergraduate	In a relationship	Yes
Bernadette	27	Undergraduate	Married	Yes
Maddy	28	Undergraduate	In a relationship	No
Christie	26	Undergraduate	In a relationship	No
Rebecca	32	Postgraduate	In a relationship	Yes
Sally	30	Postgraduate	Married	No
Michelle	35	Undergraduate	Married	Yes
Natalie	28	Undergraduate	Married	Yes
Sophie	32	Postgraduate	Single	Yes
<i>Overdue</i>				
Jennifer	33	Postgraduate	Single	No
Sonia	25	Undergraduate	In a relationship	No
Yvonne	33	Diploma	Single	No
Fiona	30	Bachelor	Married	No
Hannah	34	Postgraduate	In a relationship	No
Jessica	32	Postgraduate	In a relationship	No
<i>Never screened</i>				
Melissa	28	Undergraduate	Single	No
Angela	25	Undergraduate	Single	No
Veronica	28	Postgraduate	Married	No
Tina	25	Undergraduate	Single	No

Theme	Description	Sub-themes
Psychological factors	Intra-personal factors including women's attitudes and reactions to the test (e.g. fear or shame) and any knowledge gaps in the women that may impact adversely on their screening. Test-related pain/discomfort was coded as a psychological barrier as it caused psychological distress in some women	- Women's first experience screening - Emotional language - Choosing not to screen in future
Practical factors	Structural factors external to the screening procedure. These included barriers (e.g. time and financial cost of attending the appointment) and facilitators (e.g. reminder letter to screen).	- Prioritising screening with other demands - Utilising one GP appointment to address multiple issues - Discomfort is minor
Normalisation of screening	The social context of routine testing for women. Screening as 'no big deal'.	- Screening on the 'to do list' - External reminders - Low risk perception - Obligation to screen

Figure 4.1. Themes and sub-themes identified in Study 1.

no intention of screening in the future, and four had not previously been screened. None of the 10 women who were overdue for screening or had never been screened reported having a regular GP. In the preliminary analysis, three primary themes explaining barriers and facilitators to screening were identified. First, *practical factors*, which were defined as structural factors external to the screening procedure. These included barriers (e.g. time and financial cost of attending the appointment) and facilitators (e.g. reminder letter to screen). Second, *psychological factors*, which included women's attitudes and reactions to the test (e.g. fear or shame) and any knowledge gaps in the women that may impact adversely on their screening. Test-related pain/discomfort was coded as a psychological barrier as it caused psychological distress in some women. Third, *normalisation of screening* encompassed the social context of routine testing for women. These themes and sub-themes are displayed in Figure 4.1.

4.3.1 Psychological factors.

Psychological barriers and facilitators were more often endorsed than practical factors in the women who had not previously screened. In particular, the women were concerned about having a male perform the test, the lack of a medical explanation as to what the test involves and what it is for, and not being provided with emotional support during the procedure. For example, some of the women were unaware or unsure of the purpose of the test or when they should screen for the first time. When asked about whether she intended to screen in the future, Veronica explained:

“If I know the reason as to why people would take it [the test], then I might plan on it, but because I don’t know the reason, I’m not sure if I should be going for it or not.”

(Veronica, 28, never screened)

One woman who had not previously screened said that she would like to take a female friend or relative with her to the first screening:

“It [taking a female friend or relative] gives you kinda support ... Just the first time would be fine. The following times you know how it’s conducted.”

(Angela, 25 years old, never screened)

Melissa also identified that having a female doctor perform the test would make the procedure easier, and that practical factors were less of a concern to her:

“First of all, I’d go to a female GP and yeah, I guess that’s the most important thing to me. But otherwise I’m happy with, yeah.”

TM: Are there things that might make it difficult to have one? Like, having trouble making a doctor’s appointment, or cost, that sort of thing.

“I think it’s more, um, for me, it would be I guess I’d feel uncomfortable, especially it being my first time. I’d find it awkward.”

(Melissa, 28, never screened)

Similarly, most of the previous screeners reported a stronger emotional response during their first test than in later Pap tests. Terms such as ‘anxious’, ‘awkward’, ‘intimidated’ and ‘invasive’ were commonly used to describe the first screening experience. Most women attributed these feelings to their previous lack of knowledge about what to expect during the test.

“ It’s in the same sense you’re worried about anything for the first time. You know, there’s a lot of talk about them being very painful or just kinda feeling really invasive. But the woman who did the first one was really good at making me feel comfortable. And she did that by being very matter of fact... And also, this is going to sound stupid, but the thing that made it okay was her just saying, ‘You’re doing really well’.”

(Christie, 26, screens regularly)

In contrast, one woman said that her lack of knowledge as to what would happen made the first experience easier for her. Most women reported feeling reassured by their doctor who had explained the procedure to them the first time and provided them with some emotional support.

Most women felt that the emotional challenge of the initial screening did not interfere with later testing or their future intentions to test. Two women did describe the psychological barriers as significant enough to result in a future intention not to screen. For example, one woman felt that the test felt too invasive, whereas the other became distressed as a result of the pain/discomfort that was caused by the test. The latter woman, Hannah, was asked what would make it easier for her to screen in the future:

“Just general anaesthetic. I really couldn’t say I assume if I have another one it will be equally painful which is part of the reason I’m not racing to get one.”

(Hannah, 34, overdue, and with no intention to screen)

However, both of these women acknowledged that the screening would reduce their personal risk of cervical cancer, and both were willing consider screening in the future if the testing procedure was changed to address their concerns.

4.3.2 Practical factors.

However, both of these women acknowledged that the screening would reduce their personal risk of cervical cancer, and both were willing consider screening in the future if the testing procedure was changed to address their concerns.

“I think sometimes the cost, I think part of the reason why I group it all together is so I don’t have to pay for the specific appointment just for that. If it was bulk-billed or something like that. I think it’s being time poor ... it’s cost and being time poor that it’s hard, and with small children and that kind of thing, that theirs would come first.”

(Michelle, 35, screens regularly)

In addition, several women suggested that a ‘walk in’ screening clinic might facilitate their more regular screening, as they would not then need to align their availability with the doctor. Finally, the women often tried minimising the inconvenience or cost of the doctor’s appointment by waiting to address multiple health concerns in the one medical appointment.

“This is really terrible, but I would never make an appointment just to get it [cervical screening] done. For me it’s just, it’s usually when I’ve gone in for something else existing that I’d have had it done.”

(Anne, 29, screens regularly)

“Usually I wait until I have to go to the doctor for something else and then I’ll add it to the end of the list.”

(Michelle, 35, screens regularly)

Most prior screeners reported finding that the cervical screening was unpleasant, although the discomfort was typically minor and less salient a barrier to screening than practical factors. For example, Yvonne noted that the screening was uncomfortable but not enough to stop her from having the test in the future:

“Uncomfortable, cold It’s not the actual like getting it [cervical screening] done. It’s the getting there to get it done is the problem. I didn’t mind having it done. It’s not that bad really.”

(Yvonne, 33, overdue for screening)

“This is really terrible, but I would never make an appointment just to get it [cervical screening] done. For me it’s just, it’s usually when I’ve gone in for something else existing that I’d have had it done.”

(Anne, 29, screens regularly)

4.3.3 Normalisation of screening.

Many women indicated that the screening was on their ‘to do list’ of tasks and errands to complete, suggesting that the procedure had become routine and normalised for them. For example, when recalling her test, Sally described having a ‘full service job’ of sexual health checks at the GP clinic. In particular, the comparison of this procedure to routine car maintenance captures the routine nature of this screening from the perspective of many women.

“I called it ‘having a full service job’. [laughs] the GP who did the Pap test was removing the IUD said, ‘When was your last Pap smear? Oh, it’s about two years. Well, we’ll do that. Do you want a sexual health screening at the same time?’, I said, ‘Yeah, do it all’.

(Sally, 30, screens regularly)

As alluded to in the previous quote, many women tended to rely on external reminders to screen, rather than keeping track of the screening themselves. For example, some regular screeners relied on reminder letters from State screening registries or their GP to remind them when it was time to screen. Most often, the women's GPs raised the screening issue during a medical appointment for another matter. Thus, a number of women who regularly screened had felt that this was the main reason they were up to date with their screening.

"But I do tend to lose track of it [when screening is due] which is why it's been so good to have a regular GP who can remind you. But yeah, I do struggle to keep track.

(Anne, 29, screens regularly)

Nonetheless, several women who had previously screened expressed a keen sense of obligation to screen and felt guilty when they did not do so as was prescribed, even if there were competing demands, as articulated by Sonia.

"I would normally try to do it [screening] much quicker, at the moment I've got so many things going on this year and I've had so many appointments as well, particularly the dentist, glasses doctor, all these other things.

(Sonia, 25, overdue for screening)

Many women elected to screen despite feeling they were not personally at risk of developing cervical cancer and had little understanding of the benefits of the test. When asked about the purpose of the test, even regular screeners only had a vague understanding of the purpose of screening. Two women who had screened a number of times in the past thought that cells were taken from the uterus rather than the cervix.

"Uh, well ... um... they take a scraping of the line of the uterus? To test for any abnormalities of the cells." TM: "So do you know what the abnormalities are that they're

looking for?” *“Ah. I’m not, no I don’t know, but I don’t know but I suppose they are related to cancerous cells.”*

(Bianca, 26, regular screener)

Thus, a belief that screening was the ‘right thing to do’ was viewed as a facilitator to screening, and many of the regular screeners stated that the test was something they needed to ‘get done’, ‘had to do’ or ‘should do’.

“You don’t want to do it [attend screening]. I certainly dread it. I do it out of obligation to my health, it’s uncomfortable, but over quickly, and it’s fine. It’s just one of those things that you don’t look forward to but you get it done.”

(Bernadette, 27, screens regularly)

Jennifer, who was overdue for screening, reflected that the ‘deadline’ associated with having a prescribed screening interval added to a sense of urgency to screen. She was asked why she felt more obliged to undertake cervical screening than a skin cancer check:

“You’ve got that marked every two years thing that you’re supposed to do it and I haven’t done it. Whereas maybe if getting sunspots checked was the same, maybe if there was some kind of register or something where it was like, you need to check them every year I probably would be thinking oh I need to do that too.”

(Jennifer, 33, overdue for screening)

4.4 Discussion

Study 1 examined young women’s experiences of and barriers and facilitators to cervical screening. For the women in the study, screening was typically associated with the presence of stronger psychological barriers due to the women’s lack of familiarity

with the procedure. However, after this first screening, women typically cited practical rather than psychological factors as reasons for delaying screening. This transition from focussing on practical rather than psychological barriers to screening suggests a degree of normalisation of the procedure for many women.

Scant qualitative evidence suggests that women's first cervical screening experience is more difficult than the subsequent screening (Blomberg et al., 2011; Waller et al., 2011), though as this has not been directly addressed previously, it was unclear why this was the case. Study 1 identified that for some women, the psychological barriers associated with their first screening experience is related to a lack of familiarity with how the test is conducted. Results from Study 1 are also consistent with the limited research that has focussed on women who have never screened previously, or sampled a high proportion of these women, identifying that psychological barriers such as worry, negative attitudes to the test and knowledge gaps were most salient (Al-Naggar et al., 2010; Wong et al., 2008).

The results of this study are preliminary in nature, although they are consistent with findings in the relevant literature showing that practical barriers are more salient for young women who have previously screened relative older women (Waller et al., 2011). Waller and colleagues (2009) found in their quantitative study that psychological barriers were most commonly endorsed by women as reasons for not attending screening but the practical barriers were the strongest predictors of attendance. Eaker and colleagues (2001a) also found that practical barriers were more predictive of screening behaviour than emotional ones. In a qualitative study, Waller and colleagues (2011) found that practical barriers were more commonly reported by young British women who did not attend regular screening, relative to older women who did not attend screening. This study also implicated young women's tendency to move residence as a factor that may make it difficult to engage with primary health care. Together with findings from Study 1 this suggests that practical aspects of attending screening are important to address in this age group. However, it is important to note that practical factors may be more of a delay

than barrier, as many of the women citing practical difficulties were still up to date with screening.

For women who had screened previously, screening was considered a normalised component of their engagement with GPs, and they relied on their GP to provide a reminder that screening was due. Pertinently, all women in Study 1 who had a regular GP were also up to date with screening, whereas none of the overdue screeners had a regular GP. This is consistent with the existing literature that links engagement with primary health care to increased screening attendance (Armstrong et al., 2012; Ashok et al., 2012). These results echo those of O'Connor and colleagues who found that GPs had an influential role in promoting screening, through factors such as providing prompts to screen and reassurance from a trusted clinician (O'Connor, Murphy, Martin, O'Leary, & Sharp, 2014). Though the women in Study 1 tended to report that GPs had a positive influence on screening behaviour, other research has highlighted that GPs can also have a negative influence if they do not adequately support women during the screening (Armstrong et al., 2012). Two qualitative studies have identified that difficulty engaging with a regular GP due to increased mobility may account for young women's lower rates of screening (Waller et al., 2011). In Study 1, regular screeners appeared to be motivated by a sense of obligation, rather than to reduce cervical cancer risk. Only two women articulated that they were motivated to screen due to a sense that they were susceptible to the disease. Though the findings from this small sample size cannot be generalised to a broader population, a number of other larger studies have found young women's perceived risk of developing cervical cancer is low (Mather et al., 2012; Sadler et al., 2013; Waller et al., 2011). This highlights that GPs have to balance providing recommendations to screen with ensuring that women make an informed choice to have the procedure (Williams, Carter, & Rychetnik, 2014).

When the Australian government implements changes to the NCSP in 2017, women will be encouraged to undertake a five-yearly HPV test, rather than the current two-yearly Pap test. Women will also receive an invitation to screen for the first time

when they turn 25 years old. It is therefore an opportune time to reconsider how best to promote the new screening guidelines and most effectively remind women about the need to screen regularly. Currently, all women who have previously screened in Australia automatically receive a reminder letter from their state or territory cervical screening registry when they are 3-months overdue for screening. Many women do not receive the letter as they have moved house and their contact details on the registry are not updated. In Australia, an estimated 33% of women screen after receiving a reminder letter (AIHW, 2016), and this low response rate may be partly due to relocation of patients. It is noteworthy that this problem is likely to become more substantial when Australian women are only required to screen every 5-years, increasing the likelihood that women's contact details will become outdated in between screenings. Personalised electronic reminder systems was a strategy suggested by some of the women in Study 1, and may be particularly suited to this younger age group and be more likely to reach women who have moved residence.

Additionally, given most women in this study did not articulate a sense of being at risk for cervical cancer, health promotion material may not be effective in promoting the benefits of screening (e.g. reduced personal risk, or 'peace of mind'). Rather, the material might need to focus on contextualising the screening as a normal and routine aspect of medical check-ups for women. With regards to inviting women to screen, Study 1 suggests that a focus on knowledge gaps and psychological barriers is likely to be more effective than addressing practical concerns.

Finally, a key implication of Study 1 is that cervical screening health promotion may require a different approach based on whether the target audience have previously screened (or not). The promotion of cervical screening has previously been shown to be more effective when it is targeted at a particular audience (such as a specific age group) rather than providing a general message for all women (Luszczynska et al., 2011; Yabroff et al., 2003). In particular, practical factors such as reminder prompts were described as important by the women who had previously screened, whereas psychological factors

(e.g. fear) appeared most salient to the women who were unfamiliar with the procedure. Thus, interventions aimed at women who have not previously screened may need to focus more on clarifying the testing process and addressing women's knowledge gaps, so as to reduce their fears about the procedure, especially as some women appeared not to screen simply because they were unaware that they should do so.

However, this study has a number of limitations that may have impacted on the veracity and generalisability of the results. First, the sample size was small for a qualitative study. More interviews may have been required to identify all of the important themes, especially those raised by the smallest sub-group of women who had not previously attended screening. Further, due to the small number of women who had not previously screened, the comparison of the barriers and facilitators nominated by the two groups (i.e. screeners/ non-screeners) may not be reliable and the results require verification in a larger study. Third, the women interviewed were all highly educated and this may limit the generalisability of the results to less well educated women. However, the results of study 1 were mostly intended to inform the development of studies 2 and 3 in this thesis rather than describing the full range of issues related to their non-screening.

4.4.1 Conclusions.

Study 1 aimed to investigate young women's experiences of cervical screening and identify the barriers and facilitators the women felt had most strongly influenced their behaviour so as to better understand how perceived barriers and facilitators differ in women who have and have not previously screened. For women who had not screened previously, psychological barriers and facilitators were more salient than practical factors, associated with the novelty of the procedure for these women. For women who had attended screening more than once, practical barriers and facilitators were reported as being more pertinent to screening attendance. For these women, screening was conceptualised as a normal component of primary health care and women relied on their regular GP to remind them when screening was due and provide opportunistic screening.

The study, though small and preliminary in nature, suggests that larger studies are warranted to evaluate the role that GPs may play in promoting screening.

5. Study Two

The results of Study 1 provided a rich account of women's experiences with cervical screening, as well as the barriers and facilitators they encountered. As a qualitative study, the aim and scope of the study was to determine which factors were most salient to the women rather than evaluate whether these were associated with screening behaviour. Additionally, due to the limitations outlined in Section 4.4, a larger study was needed to test the findings of Study 1. Hence, Study 2 was designed to quantify the extent to which the factors identified by the women influenced screening behaviour. Of particular interest was evaluating whether practical factors were stronger barriers and facilitators to timely screening than psychological factors, and whether barriers and facilitators differed for women who had not screened previously. However, so that analyses were not limited to the findings generated in Study 1, in addition to categorising practical and psychological barriers, an analysis of all barriers and facilitators was conducted. Finally, as outlined in Chapter 3, another aim of the sequential exploratory mixed methods design was to use the qualitative findings of Study 1 to inform the development of Study 2. The emergent theme of normalisation of screening highlighted that an important aspect of the Study 2 questionnaire and data analysis should be exploring how having a regular GP influenced screening behaviour.

5.1 Introduction

As discussed in Chapter 2, most of the prior studies that have explored barriers and facilitators to screening attendance in young women are qualitative. This exploratory research has identified *practical barriers* such as a lack of time (Waller et al., 2011) and *practical facilitators* such as having access to a regular GP (Black et al., 2011). Additionally, *psychological barriers and facilitators* have been identified, such as a fear of the testing procedure (Al-Naggar et al., 2010) and high self-efficacy (Duffett-Leger et al., 2008) respectively. Because these studies used a qualitative methodology, it is not possible to determine the extent to which the barriers identified influence women's

screening behaviour.

Research from the UK has explored the variable impact of different barriers to women's screening practices. Waller and colleagues (2009) used cross-sectional survey data from 580 UK women to identify cervical screening barriers and found that the barrier most commonly endorsed by women in their sample, embarrassment, did not predict screening attendance, whereas practical barriers tended to be better predictors of screening attendance than psychological ones. Similar findings were reported in a study surveying 944 Swedish women (Eaker et al., 2001a). Little is known about the variable impact of different facilitators on women's screening behaviours. These results highlight the importance of following qualitative research with larger studies that allow the impact of barriers and facilitators on screening behaviour to be quantified.

In order to assess the extent to which different barriers and facilitators impact on women's screening rates in Australia, cross-sectional survey data from 338 women was examined in Study 2. Research questions examined were:

1. Are psychological or practical screening factors better predictors of women's screening behaviour?
2. Do the screening barriers and facilitators differ between younger and older women, the women who have not previously screened and those who have a regular GP?

Based on the past literature, it was hypothesised that:

1. Number of practical barriers and facilitators nominated by the women will be a stronger predictor of being overdue for screening than the number of psychological barriers nominated by the women.
2. Younger women will report a greater number of practical screening barriers and facilitators than the older women.

3. Women who had not attended screening will nominate more psychological barriers and facilitators to screening than the women who had previously screened.
4. Women who have a regular GP will be more likely to have ever attended screening, and will be less likely to be overdue for screening, relative to women who do not report having a regular GP.

5.2 Methods

5.2.1 Participants.

Ethics approval for Study 2 was granted by the ANU Human Research Ethics Committee (Approval number: 2015/614). Participants were recruited via posters placed at the ANU campus and other public areas in Canberra, Australia (e.g. shopping centres, public bathrooms) and advertisements placed on online discussion boards (e.g. Whirlpool and Reddit). Women who participated in the study were entered into a 'lottery' to win one of twelve \$20 gift vouchers. Women were eligible to participate if they were aged 25–35 years (young women) or 45–55 years (middle-aged women). The middle-aged age range was selected as this group is reported to have the highest rate of screening participation in Australia, whereas women in the 25 – 35 year age group have the lowest rate of screening (AIHW, 2016). Women also needed to reside in Australia, be fluent in English, and have been sexually active to be eligible. Four-hundred-sixty-five (465) women clicked on the online study link to access the survey and 344 completed it (participation rate=74%). Six cases were excluded due to their ineligibility for screening (i.e. not sexually active for at least 2-years, and prior hysterectomy), leaving 338 participants. A power analysis was conducted prior to recruitment to evaluate the number of participants required for the planned analyses using three predictors (i.e. practical barriers, psychological barriers and age group). A sample size of 256 was identified as being required to provide sufficient statistical power to detect small effect sizes ($f^2=0.10$) with power of .95 and alpha set at 0.005.

Two-thirds of the sample (66%, $n=222$) were young women (aged 25–35), with a

mean age of 28.9 years ($SD=3.07$), and the remaining one-third ($n=116$) were older women (aged 45–55), with a mean age of 49.2 years ($SD=3.23$). Most of the women reported being employed or studying (88%, $n=298$), and 87% reported having some tertiary education ($n=297$). Most were in a relationship or married (81%, $n=275$).

Twenty-eight percent ($n=96$) of the sample were currently overdue for screening by at least 3-months, which included 25 women (7% of the entire sample) who had never been screened. Three-quarters of the women (77%, $n=261$) reported having a regular GP. Amongst young women, two-thirds had received at least one dose of the HPV vaccine (68%, $n=150$); the HPV vaccine is offered to girls aged 12–13 in Australia.

5.2.2 Procedure.

Participants were recruited via online advertising between November 2015 and January 2016. After reading the participant information sheet and indicating their consent to participate, women were asked to complete the short online survey. Following this, women were provided with a short debriefing sheet that explained cervical cancer screening and provided additional online sources of screening information.

5.2.3 Measures.

See Appendix G for the study questionnaire. Participants were first asked about demographics including their age, relationship status, employment status, and whether the women had a regular GP (i.e. GP status). They were also asked about whether they had previously attended cervical screening and, if so, the month and year of their most recent screening. Given that participants in Study 1 had poor knowledge of cervical screening and at times expressed confusion about the procedure, a definition of a Pap test was included prior to answering these questions.

Typically, Australian state and territory screening registries send out a reminder letter 3-months after the due date for screening – informing the women that they are overdue for screening attendance. Thus, the women were considered to be overdue for

screening if they had not screened in the past 27-months (i.e. 3-months overdue for screening), including the women who had never previously screened.

Barriers & facilitators to cervical screening.

Using free text, women were asked to list up to ten factors that had made it difficult for them to attend screening in the past. Following this, women were also asked to list ten factors that made it easier for them to attend screening. Free text responses were used rather than asking participants to endorse a set list of barriers and facilitators (e.g. Waller et al., 2009). The advantage of this method is that the women could nominate the reasons that were most salient to them rather than being limited to the options presented by the researchers. The disadvantages of this method are that coding the responses quantitatively is time-consuming, participants with poor insight may fail to articulate the barriers and facilitators they encountered and/or they may fail to consider some issues unless they are prompted to do so.

All barriers and facilitators that were listed by the women were coded as either practical or psychological in nature. This coding system was developed and refined by two of the researchers (TM and RB), as detailed below. *Psychological factors* were defined as emotional responses to the screening procedure (e.g. anxiety about test results, or feeling reassured by a friendly doctor). In addition, they included the women's declared knowledge gaps (e.g. not knowing when to screen) and their perceived risk of developing cervical cancer. In this study, pain/discomfort caused by the procedure was considered to be a psychological barrier as it contributed to psychological distress in many women. *Practical factors* were defined as factors that were external to the individual, including the logistics of attending the screening appointment, such as a perceived lack of time or having a clinic located close to home.

From this data, four scores were generated for each individual: practical barriers, psychological barriers, practical facilitators and psychological facilitators. Scores for each of these categories ranged from 0–10, indicating how many practical or psychological

factors had been cited. The mean practical barrier score was 1.74 ($SD=1.39$). The mean practical facilitator score was 1.57 ($SD= 1.28$). The mean psychological barrier score was 1.75 ($SD=1.77$). The mean psychological facilitator score was 1.38 ($SD=1.22$).

5.2.4 Statistical analysis.

All statistical analyses were conducted using Statistical Package for the Social Sciences version 23 ([SPSS]; IBM, 2015). Logistic regression analysis first explored the relationships between age group, number of practical and psychological barriers cited by the women, and whether the women were overdue for cervical screening. *Chi-square* analyses were then used to identify the specific barriers that were correlated with screening non-attendance. These analyses were repeated to examine the total number of facilitators as well as individual facilitators. Due to the multiple comparisons utilised in the data analyses, Bonferroni adjustments were applied, with a significance level set at $p<.005$.

5.3 Results

Two-thirds of the sample (66%, $n=222$) were young women (aged 25–35), with a mean age of 28.9 years ($SD=3.07$), and the remaining one-third ($n=116$) were middle-aged women (aged 45–55), with a mean age of 49.2 years ($SD=3.23$). Most of the women reported being employed or studying (88%, $n=298$), and 87% reported having some tertiary education ($n=297$). Most were in a relationship or married (81%, $n=275$). Twenty-eight percent ($n=96$) of the sample were currently overdue for screening by at least 3-months, which included 25 women (7% of the entire sample) who had never been screened. Three-quarters of the women (77%, $n=261$) reported having a regular GP. Amongst young women, two-thirds had received at least one dose of the HPV vaccine (68%, $n=150$); the HPV vaccine is offered to girls aged 12–13 in Australia. Prior to the main analyses, correlations between the outcome variables (i.e. overdue for screening status, age group, prior screening and having a regular GP) and socio-demographics (i.e. ethnicity, employment status, education level and relationship status) were calculated.

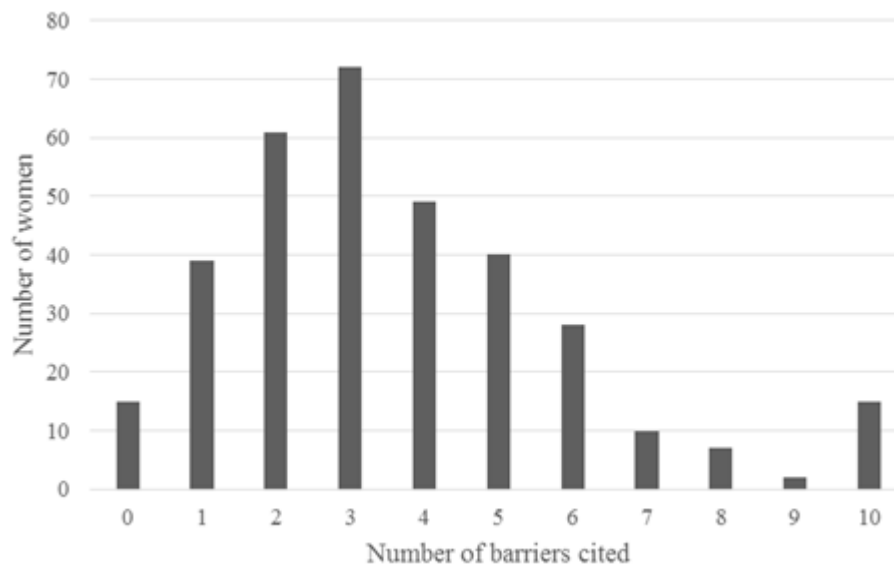


Figure 5.1. Number of women citing 0 – 10 barriers.

The only statistically significant correlations were between younger age group and no prior screening, and younger age group and not having a regular GP. That is, compared to middle-aged women, women in the younger age group were less likely to have ever attended screening ($r=0.18$, $p<0.001$) and less likely to have a regular GP ($r=0.19$, $p<0.001$).

5.3.1 Barriers and facilitators cited.

The mean number of barriers cited by the women was 3.7 ($SD=2.31$) and the mean number of facilitators was 3.1 ($SD=1.9$). The most frequently cited barrier was a lack of time (63%), then discomfort/pain during the test (36%), financial cost of the test (31%), embarrassment (29%), and anxiety about the test (21%). The most commonly cited facilitator was the cost of the test (i.e. free or inexpensive; 58%), friendly/warm attitude of the clinician conducting the test (53%), appointment availability (26%), external reminders or prompts to attend screening (23%), and having a female clinician conduct the test (22%). Figures 5.1 and 5.2 show the number of barriers and facilitators cited by women in the study.

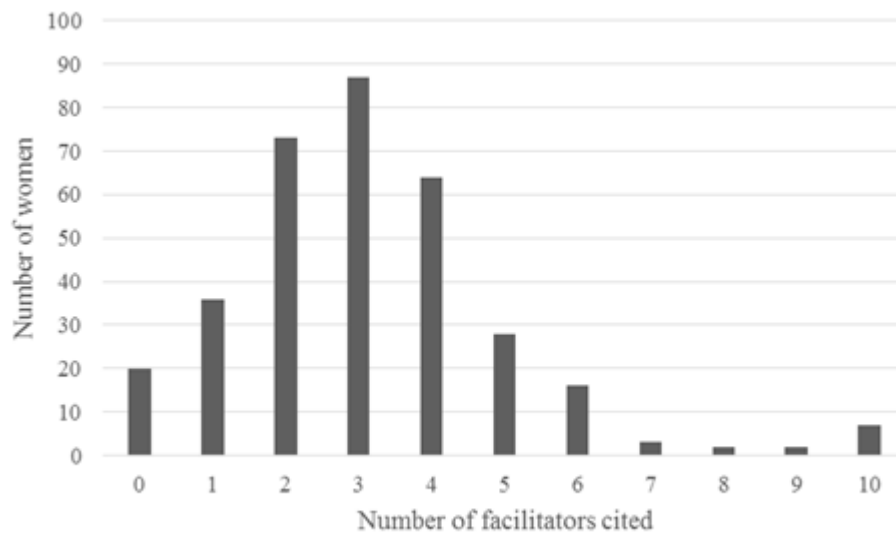


Figure 5.2. Number of women citing 0 – 10 facilitators.

5.3.2 Barrier and facilitator scores predicting screening attendance.

No demographic or health variables (i.e. education level, employment or relationship status, HPV vaccination status or age group) were significantly correlated with being overdue for screening. Thus, these variables were not included as covariates in the analyses, although age group was included as a covariate in the logistic regression analyses as it was related to the central research question.

In the first logistic regression analysis, the number of psychological and practical *barriers* cited by the women were examined as predictors of being overdue for screening in the entire sample. Using a Cox and Snell R -square estimate ($df = 3$), the model predicted 7% of the variance in being overdue for screening. After controlling for age group, only psychological barrier score, but not practical barrier score, was shown to predict being overdue for screening. Each additional psychological barrier cited increased the odds of being overdue for screening by 36%, see Table 5.1.

In the next logistic regression analysis, the number of psychological and practical *facilitators* cited by the women were examined as predictors of being overdue for screening. The model did not predict significant variance in being overdue for screening

($df = 3$). Thus, after controlling for age group, neither practical nor psychological facilitator score predicted being overdue for cervical screening; see Table 5.1.

Table 5.1

Barrier and facilitator scores predicting being overdue for screening, adjusted for age group.

	Odds Ratio (95% CI)	p	Cox and Snell R^2	p
Model 1: <i>Barriers</i>			.069	<.001*
Psychological score	1.36 (1.18-1.56)	<.001*		
Practical score	0.82 (0.68-0.99)	.041		
Model 2: <i>Facilitators</i>			.018	.105
Psychological score	0.90 (0.74-1.11)	.319		
Practical score	0.80 (0.65-0.98)	.033		

* significant at $p=.005$

5.3.3 Individual barriers and facilitators associated with screening attendance.

Individual barriers and facilitators were examined as predictors of screening non-attendance using *Chi-square* tests ($df = 337$); see Table 5.2. The women who were overdue for screening were more likely to cite embarrassment as a barrier ($p<.001$) and less likely to cite an inexpensive test as a facilitator of screening ($p=.003$). There was a non-significant trend towards up-to-date screeners more commonly endorsing external screening reminders ($p=.007$).

Table 5.2

Individual barriers and facilitators associated with being overdue for screening.

	Up to date	Overdue	
	<i>n</i> (%)	<i>n</i> (%)	χ^2
<i>Barriers</i>			
Lack of time	156 (67)	52 (54)	4.57
Embarrassment	54 (23)	41 (43)	12.78*
Discomfort	81 (35)	38 (40)	0.73
Cost	75 (32)	27 (28)	0.49
Anxiety	45 (19)	24 (25)	1.37
<i>Facilitators</i>			
Cost	149 (64)	44 (46)	8.93*
Clinician attitude	134 (57)	42 (44)	5.00
Appointment availability	56 (24)	28 (29)	0.98
Reminder	61 (26)	12 (13)	7.27
Female clinician	48 (21)	23 (24)	0.48

* significant at $p=.005$

5.3.4 Screening factors according to age group.

Screening history, GP factors, and individual barriers and facilitators were examined by age group, using *Chi*-square tests ($df = 337$); see Table 5.3. Younger women were significantly less likely to have ever attended screening ($p < .001$) and have a regular GP ($p < .001$). Contrary to the study hypothesis, they cited significantly more psychological barriers ($p < .001$) than middle-aged women, especially discomfort ($p < .001$) and anxiety ($p < .001$). However, total facilitator score and the individual facilitators did not significantly differ between the two age groups.

5.3.5 Screening factors according to screening history.

A number of psychological and practical barriers and facilitators and individual barriers and facilitators were examined in relation to whether women had screened previously, using independent-samples *t*-tests ($df = 337$) and *Chi*-square tests ($df = 337$), as appropriate; see Table 5.4. As hypothesised, women who had never attended screening reported more psychological barriers than the women who had not screened before ($p = .001$), but fewer practical barriers ($p < .001$). They also reported fewer practical facilitators ($p = .002$). In terms of individual barriers, they were less likely to cite a lack of time ($p = .001$) but were more likely to cite embarrassment ($p = .002$) or anxiety ($p = .003$), relative to women who had screened before.

5.3.6 Screening factors according to GP status.

Finally, the influence of having a regular GP was examined in relation to number of psychological and practical barriers and facilitators, individual barriers and facilitators, and being overdue for cervical screening, using independent-samples *t*-tests ($df = 337$) and *Chi*-square tests ($df = 337$), as appropriate; see Table 5.5. In line with the study hypotheses, women who reported having a regular GP were less likely to be overdue for screening ($p < .001$) or to have never attended screening ($p < .001$). They also reported fewer psychological barriers ($p = .001$) and were less likely to cite anxiety as a barrier ($p = .002$), relative to women who did not have a regular GP.

Table 5.3

Screening factors according to age group.

	Younger women	Older women	
<i>Medical history</i>	<i>n (%)</i>	<i>n (%)</i>	χ^2
Overdue for screening	62 (28)	34 (30)	0.13
Never attended screening	24 (11)	1 (1)	11.01*
Has regular GP	158 (71)	103 (89)	13.45*
<i>Individual Barriers</i>			
Lack of time	138 (62)	76 (66)	0.37
Embarrassment	74 (33)	23 (20)	6.79
Discomfort	95 (43)	26 (22)	13.77*
Cost	74 (33)	29 (25)	2.45
Anxiety	60 (27)	11 (10)	14.13*
<i>Individual Facilitators</i>			
Cost	135 (61)	61 (53)	2.12
Clinician attitude	126 (57)	52 (45)	4.35
Appointment availability	58 (26)	29 (25)	0.05
Reminder	51 (23)	27 (23)	<0.01
Female clinician	45 (20)	29 (25)	1.00
<i>Barrier scores</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>
Practical	1.7 (1.33)	1.8 (1.50)	-0.76
Psychological	2.0 (1.87)	1.2 (1.40)	4.83*
<i>Facilitator scores</i>			
Practical	1.6 (1.32)	1.5 (1.19)	0.95
Psychological	1.5 (1.22)	1.2 (1.19)	2.22

* significant at $p=.005$

Table 5.4

Barriers and facilitators according to screening history.

	Never attended screening	Previously screened	
<i>Individual Barriers</i>	<i>n (%)</i>	<i>n (%)</i>	χ^2
Lack of time	8 (32)	206 (66)	11.38*
Embarrassment	14 (56)	83 (27)	9.83*
Discomfort	9 (36)	112 (36)	0.00
Cost	5 (20)	98 (31)	1.40
Anxiety	11 (44)	60 (19)	8.60*
<i>Individual Facilitators</i>			
Cost	9 (36)	187 (60)	5.3
Clinician attitude	10 (40)	168 (54)	1.73
Appointment availability	5 (20)	82 (26)	0.47
Reminder	2 (8)	76 (24)	3.46
Female clinician	3 (12)	71 (23)	1.55
<i>Barrier scores</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>
Practical	0.7 (0.74)	1.8 (1.40)	-6.58*
Psychological	3.4 (2.35)	1.6 (1.65)	3.73*
<i>Facilitator scores</i>			
Practical	0.8 (1.04)	1.6 (1.28)	-3.15*
Psychological	1.4 (1.38)	1.4 (1.21)	-0.07

* significant at $p=.005$

Table 5.5

Barriers and facilitators according to GP status.

	No regular GP	Has regular GP	
<i>Screening History</i>	<i>n (%)</i>	<i>n (%)</i>	χ^2
Overdue for screening	39 (53)	57 (22)	26.91*
Never attended screening	14 (18)	11 (4)	16.94*
<i>Individual Barriers</i>			
Lack of time	43 (56)	171 (66)	2.40
Embarrassment	27 (35)	70 (27)	1.98
Discomfort	29 (38)	92 (35)	0.15
Cost	26 (34)	77 (30)	0.51
Anxiety	26 (34)	45 (17)	9.79*
<i>Individual Facilitators</i>			
Cost	43 (56)	153 (59)	0.19
Clinician attitude	33 (43)	145 (56)	3.85
Appointment availability	19 (25)	68 (26)	0.06
Reminder	12 (16)	66 (25)	3.15
Female clinician	11 (14)	63 (24)	3.36
<i>Barrier scores</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>
Practical	1.9 (1.33)	1.7 (1.41)	1.12
Psychological	2.4 (2.18)	1.6 (1.59)	3.47*
<i>Facilitator scores</i>			
Practical	1.5 (1.45)	1.6 (1.22)	-0.36
Psychological	1.4 (1.21)	1.4 (1.23)	0.01

* significant at $p=.005$

5.4 Discussion

Study 2 examined whether practical or psychological barriers and facilitators were predictors of cervical screening behaviour, and evaluated whether this was different for young women (relative to middle-aged women), women who had not screened previously (relative to women who had) and those with a regular GP (relative to those who did not). Results indicated that women who had not screened previously reported more psychological barriers to screening than the prior screeners, especially embarrassment and anxiety. However, they reported fewer practical barriers (e.g. lack of time) relative to the prior screeners, likely because they lacked any familiarity with the logistics of the screening. Contrary to the study hypothesis, younger women reported a greater number of psychological, but not practical, screening barriers than middle-aged women.

Among the women who had screened previously, citing more psychological barriers was associated with being overdue for screening, especially embarrassment about the procedure. Similarly, citing more psychological barriers was associated with no prior screening, especially embarrassment and anxiety about the procedure. In contrast, the women who had a regular GP reported fewer perceived psychological barriers and they were more likely to be up to date with screening. However, number of practical and psychological facilitators was not associated with being overdue for screening or prior screening attendance, although the low cost of the test was related to screening attendance in the entire sample. Further, the different individual facilitators did not differ between the women who did or did not have a regular GP or between the younger and middle-aged women. These results were not wholly consistent with the findings of Study 1, and this discrepancy will be discussed in detail in Chapter 7.

The results of Study 2 are generally in line with prior literature reports that identify psychological responses to the test, including embarrassment, anxiety, and fear of the pain, as significant barriers to screening among prior screeners (Nathoo, 1988; Oscarsson et al., 2008). In contrast, the results are inconsistent with those of Eaker and

colleagues (2001a) and Waller and colleagues (2009) who found that practical barriers were stronger predictors of screening non-attendance in these women. It is unclear whether the inconsistency is due to salient differences in the provision of health services in Europe and Australia (e.g. needing to register with a practice to access a GP in the UK) or methodological differences between the studies. For example, women in Study 2 were sampled within two age groups and were asked to identify the barriers and facilitators they had encountered to cervical screening. In contrast, participants in the study by Waller and colleagues (2009) were aged 26–64 years old and were given a list of barriers and asked to endorse which ones they had previously encountered.

Furthermore, in terms of the screening facilitators, there is a large body of research linking increased health service use with greater screening attendance (Black et al., 2011; Eaker, Adami, & Sparén, 2001b; Olesen et al., 2012; Oussaid et al., 2013). In Study 2, the strongest facilitator of screening attendance was having a regular GP, and women who had a regular GP were less likely to cite psychological barriers to cervical screening. However, this facilitator was not nominated by any of the women in the sample. Nonetheless, GPs may be best placed to address the practical and psychological barriers typically experienced by young and middle-aged women in association with the procedure and to identify the women who have not screened before. It is also noteworthy that in Study 2, the women were less likely to have a regular GP than middle-aged women, consistent with national statistics (ABS, 2015).

Several study limitations may have impacted on the veracity of Study 2 results. First, the sample was restricted in terms of age such that two distinct age samples were surveyed rather than examining age as a continuous variable, and this may explain the non-significant associations between younger age and screening status. It should also be acknowledged that the group of ‘older’ women were only middle-aged and hence the study cannot provide insight into the processes characteristic of women aged over 55 years. Second, due to the lack of an available instrument, validated questionnaires were not used in this study. Fourth, a high proportion of participants were tertiary educated

and this was likely due to the requirement to have internet access to participate in the study. That is, online studies tend to skew recruitment towards younger adults with high educational attainment (Howard, Rainie, & Jones, 2001), and this may have limited the generalisability of the study results. Nonetheless, online studies have a number of benefits including efficient recruitment, not needing to transcribe written results, and recruiting participants from a variety of locations. Fifth, it was difficult to determine the true response rate in this study as the survey tool did not collect data on how many individuals viewed the study information but did not choose to participate. Sixth, practical factors may have been under-represented in the study as the women who experienced practical barriers (e.g. lack of time to have test) may also have had less time to commit to the study. Sixth, only a small amount of the variance in screening attendance was predicted in the regression analyses, although this is consistent with prior literature reports indicating that a broader range of factors such as self-efficacy and perception of risk and susceptibility are strongly associated with screening behaviour (Bish et al., 2000). Finally, Study 2 was cross-sectional in nature, therefore precluding any causal inferences being drawn.

5.4.1 Conclusions.

In Study 2, psychological screening barriers and not having a regular GP were predictors of cervical screening non-attendance. Facilitators were not associated with screening attendance, with the exception of women who endorsed the low cost of the test. Younger women and those who had never screened before were more likely to report psychological barriers and were less likely to have a regular GP. Taken together, the results highlight the importance of GPs in facilitating cervical screening and addressing women's psychological barriers to screening, since it is likely that the low screening rates amongst young women are due in part to their tendency not to have a regular GP. Thus, it is important to encourage all young women to engage with a regular GP as this is likely to increase their rate of cervical screening.

6. Study Three

Consistent with much of the literature on cervical cancer screening, Studies 1 and 2 focussed on barriers and facilitators to cervical screening, identifying specific factors influencing screening behaviour such as embarrassment, in addition to evaluating whether psychological or practical barriers to screening were more important. However, one of the broad research questions for this thesis was whether social-cognitive models provide a better account of factors influencing screening behaviour than analysis of barriers and facilitators. Indeed, in Study 2, only 7% of the variance in screening behaviour was accounted for by the number of barriers nominated by the women, and number of facilitators was not a significant predictor of screening behaviour. Hence, in Study 3, the focus moves beyond the analysis of barriers and facilitators to evaluate the broader range of factors included in two social-cognitive models of health behaviour.

6.1 Introduction

Social-cognitive theoretical models — such as the *Theory of Planned Behaviour*, *Health Belief Model* and *Protection Motivation Theory* — have been applied widely to better understand the reasons why individuals may or may not perform health behaviours such as cancer screening. However, the majority of cervical screening research has not utilised the models, instead focussing on the barriers and facilitators to screening. The latter research base has identified that standalone factors such as embarrassment about the procedure (Armstrong et al., 2012), low perceived risk to developing cervical cancer (Sadler et al., 2013), difficulties in making appointments (Waller et al., 2009) and fear of the test or abnormal results (Eaker et al., 2001b) may affect screening attendance. However, it is not clear which of these factors are most important to address. Nor is there an integrated conceptualisation of the factors that may influence a woman's screening attendance.

Thus, in Study 3, the utility of the *Theory of Planned Behaviour* and the *Health Belief Model* was tested in predicting women's intentions to undergo cervical cancer

screening, as well as their recent screen behaviour. Due to time and resource limitations, a cross-sectional design was utilised, thus, the womens future intentions were used to predict current behaviour. The limitations of this methodology are discussed in Section 6.4.

6.1.1 Theory of Planned Behaviour and Integrated Behaviour Model.

The *Theory of Planned Behaviour* (TPB) is derived from the *Theory of Reasoned Action*, a model that implicated two variables, *subjective norms* and *attitudes*, in predicting a person's intention and behaviour (Ajzen & Fishbein, 1980). Attitudes are beliefs about the expected outcome of performing the behaviour, and subjective norms relate to whether the individual believes that others approve of the behaviour. The TRA was later expanded to include *perceived behavioural control*, the extent to which an individual believes the behaviour is easy to perform and renamed the *Theory of Planned Behaviour* (Ajzen, 1991). According to the TPB, intention is the closest determinant of behaviour, although there is little empirical support for this assertion, as detailed below. Nonetheless, the three predictors in the TPB can explain a considerable amount of the variance in health behaviour and intention. As discussed in greater detail in Section 2.1.3, meta-analytic evidence suggests that TPB variables may account for 39–41% of the variance of intentions to screen, and 27–34% of behaviour (Armitage & Conner, 2001; Godin & Kok, 1996). More recently, the TPB has been expanded to include additional factors to become the *Integrated Behavioural Model*. The IBM includes all of the TPB variables as well as four predictors that can influence behaviour directly rather than via intentions: knowledge, salience of the behaviour, environmental constraints and habit (Montano & Kasprzyk, 2008), though this has not been applied to the cervical screening context. In this preliminary analysis, two of the IBM variables were chosen to be evaluated in Study 3. The two IBM variables, knowledge and habit (operationalised as past behaviour), were chosen as they have previously been identified in the literature as being related to cervical screening behaviour (Mather et al., 2012; Olesen et al., 2012).

6.1.2 The Health Belief Model.

The *Health Belief Model* (HBM) posits that individuals are more likely to engage in health behaviour when they perceive that the illness is severe (*perceived severity*), that they are susceptible to the illness (*perceived susceptibility*), and that the *perceived benefits* of the behaviour outweigh the *perceived barriers* (Rosenstock, 1974). *Self-efficacy* is also included in the HBM in some studies (Rosenstock, 1990). A recent meta-analysis of the HBM variables indicated that perceived barriers and benefits were the strongest predictors of health behaviour (Carpenter, 2010). However, only a small number of older studies have used the HBM to evaluate cervical screening behaviour specifically, with considerable variation in the results (Bish et al., 2000; Burak & Meyer, 1997; Hennig & Knowles, 1990; Hill et al., 1985). Hence, to clarify the utility of the HBM for predicting cervical screening intentions and behaviour, further research is warranted.

Thus, the aims of Study 3 were to compare the TPB and HBM for their utility in predicting the uptake of cervical screening, to determine which variables best predicted women's intention to screen and their screening behaviour. Research questions were:

1. Is the TPB or the HBM a better predictor of women's cervical screening intentions and behaviour?
2. Are the IBM variables significant predictors of women's screening behaviour?
3. Do the results differ between younger and older women, and between those who have screened and not screened previously?

Based on the past literature, it was hypothesised that:

1. The TPB will be a stronger predictor of women's cervical screening intentions and behaviour than the HBM.

2. The IBM variables will be significant additional predictors of screening behaviour when added to the TPB model.

6.2 Methods

6.2.1 Participants and procedure.

This study utilised the same sample as Study 2. Participant characteristics and procedure are outlined in Section 5.2.1. In summary, participants were 338 Australian women recruited in two age categories: 25–35 years (young women) and 45–55 years (middle-aged women), and were asked to complete a short online survey. Of note, a high proportion of the sample (88%, $n=297$) held a tertiary qualification and the rest had completed Year 10 or 12 (12%, $n=41$). Twenty-eight percent ($n=96$) of the sample were currently overdue for screening by at least 3-months, which included 25 women (7% of entire sample) who had not previously screened. Three-quarters of the women (77%, $n=261$) reported having a regular GP.

6.2.2 Measures.

Participants were first asked about demographics including their age, relationship status, employment status, whether they had a regular GP and about their past cervical screening behaviour.

Three items were used to measure future *intentions to attend cervical cancer screening*. In line with guidelines for measuring intentions, a specific time-frame (i.e. 2-years) was referred to in the questions (Conner & Sparks, 2007). The items were worded as follows: (1) “It is important that I have a Pap test every two years”; (2) “I am willing to have a Pap test every two years”; and (3) “I intend to have a Pap test every two years”. The items were rated using 7-point Likert type scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with high scores indicating a greater intention to screen.

The 3-item scale showed excellent internal consistency with a Cronbach’s of .91. Participants were asked about their prior *screening behaviour*, including the month and

year of their most recent screening attendance. While in Study 2 barriers associated with being *overdue* for screening were evaluated, in this study the dependent variable evaluated was being *up to date* with screening. Consistent with Study 2, women were considered to be up to date with screening if they reported having attended screening in the preceding 27 months.

Theory of Planned Behaviour variables.

Past research on the TPB (Hill et al., 1985), as well as Ajzen and Fishbein's guidelines (1980) were used to inform the development of measures to assess the screening-specific TPB constructs. Unless otherwise specified, the scale items were rated using seven point Likert type scales ranging from 1 (strongly disagree) to 7 (strongly agree), with high scores indicating higher levels of the constructs.

Five items were used to assess *attitudes* toward cervical cancer screening. Each scale item was rated using seven point scales, with the following adjectives provided as anchors for the five items: (1) not at all important to very important; (2) not at all effective to very effective; (3) very harmful to very beneficial; (4) very foolish to very wise; and, (5) very desirable to very undesirable. A mean attitude score was calculated, with high scores indicating more positive attitudes toward the screening. The item scores showed high internal consistency with a Cronbach's alpha of .80.

Three items were used to measure *subjective norms* related to the screening. The three items were worded as follows: (1) "Most of my family thinks I should have a Pap test every two years"; (2) "Most of my friends think I should have a Pap test every two years"; and (3) "Most women have a Pap test every two years". The three item scale showed adequate internal consistency with a Cronbach's alpha of .75.

Three items were used to measure *perceived behavioural control* in regards to screening attendance. The items were worded as follows: (1) "I have control over whether I have a Pap test every two years"; (2) "If I wanted to, I could easily have a Pap test every two years"; and (3) "It is up to me whether or not I have a Pap test every two years". The

three item scale showed high internal consistency with a Cronbach's alpha of .80.

Integrated Behavioural Model variables.

Consistent with the IBM (Montano & Kasprzyk, 2008), two additional IBM variables were evaluated as follows: *Past behaviour* was operationalised as the total number of times women reported attending cervical screening in the past; *Knowledge* was assessed using two multiple-choice questions that tested the women's knowledge of salient aspects of the cervical screening guidelines (i.e. when should women commence screening, and how often should they screen after this). One point was awarded for each correct answer, with the score ranging from 0–2.

Health Belief Model variables.

Unless otherwise specified, the HBM items were rated using seven point Likert type scales ranging from 1 (strongly disagree) to 7 (strongly agree), with high scores indicating higher levels of the constructs.

Three items were used to measure *perceived benefits* related to the screening. The items were worded as follows: (1) "If I had a Pap test, it would lower my risk of developing cervical cancer"; (2) "If I had a Pap test, it would give me peace of mind about my health"; and (3) "If I had a Pap test, it would not improve my health". High scores indicated greater perceived benefits of the screening. The three item scale showed adequate internal consistency with a Cronbach's alpha of .66.

Three items were used to measure *perceived susceptibility* to developing cervical cancer. The three items were worded as follows: (1) "I am at risk of developing cervical cancer"; (2) "Women my age are at risk of developing cervical cancer"; and (3) "Compared to other women my age, I am more likely to develop cervical cancer". The three item scale showed adequate internal consistency with a Cronbach's alpha of .73.

Three items were used to measure *perceived severity* related to cervical cancer. The items were worded as follows: (1) "If I was diagnosed with cervical cancer, it would

be a severe threat to my health”; (2) “Cervical cancer is a more serious disease than other diseases I know”; and (3) “Being diagnosed with cervical cancer would be devastating”. The three item scale showed excellent internal consistency with a Cronbach’s alpha of .99.

Three items were used to measure *self-efficacy* related to the screening. The items were worded as follows: (1) “I am confident I could have a Pap test if I decided to get one”; (2) “I am confident I could have a Pap test even if I was very busy”; and (3) “I am confident I could have a Pap test even when things make it difficult”. The three item scale showed high internal consistency with a Cronbach’s alpha of .83.

Barriers related to the screening were operationalised as the number of barriers to screening the women listed, as measured in Study 2. Using free text, the women were asked to list up to ten different factors that had made it difficult for them to attend screening in the past.

6.2.3 Statistical analysis.

All statistical analyses were conducted using SPSS (version 23; IBM, 2015). Four-hundred-sixty-five (465) women clicked on the online study link to access the survey but only 344 women completed it (participation rate=74%). Six cases were excluded due to their ineligibility for screening (i.e. not sexually active for at least 2-years, and prior hysterectomy), leaving 338 participants. However, of these, 8 women (2%) did not report the date of their last cervical screening attendance and so the cases were omitted from analyses when this variable was assessed. Further, 3 cases did not complete the TPB and HBM questions, and so they were omitted from analyses using these variables. Hierarchical multiple linear regression analyses were used to assess the extent to which the TPB and HBM variables predicted the women’s intention to screen. Logistic regression models were then used to assess the extent to which the TPB and HBM variables (including intentions) predicted the women’s recent screening behaviour. IBM variables were only included in the model evaluating the TPB in its ability to predict screening behaviour, as the IBM is an extension of the TPB and the variables are

hypothesised to influence a person's health behaviour directly rather than via their intentions (Montano & Kasprzyk, 2008). A p value of 0.05 was regarded as statistically significant.

6.3 Results

Prior to the main analyses, correlations between potential covariates (i.e. demographic characteristics and medical history) and dependent variables were calculated. GP status (i.e. having a regular GP) was significantly correlated with screening intentions and behaviour, thus, it was included as a covariate in the models. Age group was also included in the models, given the use of two distinct age groups. Age group was not correlated with screening intentions or behaviour, though it was correlated with perceived severity, self-efficacy, barriers and knowledge. That is, in comparison to middle-aged women, younger women reported higher perceived severity, lower perceived self-efficacy, greater number of barriers to screening and higher knowledge scores. Means, standard deviations and a correlational matrix of the key study variables are presented in Table 6.1.

Table 6.1

Descriptive statistics of the key study variables and their correlations with intentions to screen and screening behaviour.

	<i>Mean (SD)</i>	<i>Range</i>	<i>n (%)</i>	<i>r (Intention to screen)</i>	<i>r (Screening behaviour)</i>
Young age group			222 (66)	.09	-.02
Has regular GP			261 (77)	.29**	.29**
Intention	17.5 (4.2)	3-21	1	1	.61**
Up to date with screening			234 (69)	.61**	1
Attitudes	28.7 (4.8)	11-35		.73**	.41**
Subjective norms	14.6 (3.2)	5-21		.40**	.25**
Perceived behavioural control	19.1 (2.4)	6-21		.44**	.24**
Past behaviour	6.8 (6.2)	0-36		.34**	.29**
Knowledge	1.3 (0.6)	0-2		-.02	-.03
Benefits	14.2 (3.8)	3-21		.56**	.28**
Susceptibility	12.4 (3.4)	3-21		.27**	.20**
Severity	15.9 (3.0)	6-21		.20**	.1
Self-efficacy	17.5 (3.8)	3-21		.56**	.42**
Barriers	3.7 (2.3)	0-10		-.18**	-.1

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

6.3.1 Screening intentions.

Hierarchical multiple regression analysis examined the *Theory of Planned Behaviour* variables (i.e. attitudes, subjective norms and perceived behavioural control) as predictors of intention to attend screening. After controlling for age group and GP status, the model predicted 58% (*R*-square) of the variance in intention to screen, $F=91.4$, $df = 5$, $p < .001$. The significant predictors of intention to screen were attitudes ($p < .001$), perceived behavioural control ($p < .001$) and GP status ($p = .004$); see Table 6.2.

In a separate analysis, the *Health Belief Model* variables (i.e. perceived susceptibility, perceived severity, perceived benefits and perceived barriers) were examined as predictors of intention to attend screening. After controlling for age group and GP status, the model predicted 49% (*R*-square) of the variance in intention to screen, $F=44.7$, $df = 7$, $p < .001$. Perceived benefits ($p < .001$), susceptibility ($p = .018$), severity ($p = .009$) and self-efficacy ($p < .001$) were significant predictors of intention to screen, see Table 6.2.

Table 6.2

Theory of Planned Behaviour and Health Belief Model variables as predictors of screening intentions.

	<i>B (95% CI)</i>	<i>SE B</i>	<i>Beta</i>	<i>T</i>	<i>sr²</i>
<i>TPB Step 1</i>					
Age group	0.3 (-0.7-1.2)	0.48	0.03	0.5	<.01
GP status	2.9 (1.8-3.9)	0.54	0.29	5.3**	.08
<i>TPB Step 2</i>					
Age group	0.4 (-0.6-0.7)	0.33	<0.01	0.1	<.01
GP status	1.1 (0.4-1.9)	0.38	0.11	2.9**	.01
Attitudes	0.6 (0.5-0.6)	0.04	0.63	16.1**	.33
Subjective norms	<0.1 (<-0.1-0.1)	0.06	0.03	0.1	<.01
Perceived behavioural control	0.3 (0.2-0.5)	0.07	0.19	5.1**	.03
<i>HBM Step 1</i>					
Age group	0.3 (-0.7-1.2)	0.48	0.03	0.5	<.01
GP status	2.9 (1.8-3.9)	0.54	0.29	5.3**	.08
<i>HBM Step 2</i>					
Age group	0.3 (-0.4-1.1)	0.38	0.04	0.9	<.01
GP status	1.3 (0.4-2.1)	0.44	0.12	2.9**	.01
Benefits	0.4 (0.3-0.5)	0.05	0.37	8.6**	0.1
Susceptibility	0.1 (<0.1-0.2)	0.05	0.1	2.3*	<.01
Severity	0.2 (<0.1-0.3)	0.06	0.11	2.6**	.01
Self-efficacy	0.4 (0.3-0.5)	0.05	0.35	7.8**	.09
Barriers	<0.1 (-0.1-0.2)	0.08	0.01	0.2	<.01

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

6.3.2 Screening behaviour.

A hierarchical logistic regression analysis examined the same TPB variables, additional IBM variables (i.e. knowledge and past behaviour), and intentions to screen as predictors of recent screening behaviour; see Table 6.3. After controlling for age group and GP status, the total model predicted 37% (Cox & Snell *R*-square) of the variance in recent screening behaviour, $\chi^2 = 146.4$, $df=8$, $p<.001$. Only intention to screen and past behaviour were significant predictors of screening behaviour, such that a 1-point increase in intentions was related to the 47% increased odds of recent screening behaviour ($p<.001$), and each additional Pap test in the past increased the odds of recent screening by 15% ($p=.004$).

In a separate analysis, the HBM variables and intention to screen were examined as predictors of recent screening behaviour. After controlling for age group and GP status, the model predicted 37% (Cox & Snell *R*-square) of the variance in recent screening behaviour, $\chi^2 = 151.2$, $df=8$, $p<.001$. Only intentions and self-efficacy predicted screening behaviour, such that a 1-point increase in intentions was related to the 52% increased odds of being up to date with screening ($p<.001$) and a 1-point increase in self-efficacy increased odds of screening by 13% ($p=.029$); see Table 6.3.

Table 6.3

Theory of Planned Behaviour and Health Belief Model variables as predictors of screening behaviour.

	<i>B</i>	<i>SE B</i>	<i>Wald</i>	<i>Odds Ratio (95% CI)</i>
<i>TPB Step One</i>				
Age group	-0.5	0.28	2.6	0.6 (0.4-1.1)
GP status	1.5	0.3	24.2	4.3 (2.4-7.7)**
<i>TPB Step Two</i>				
Age group	-1.9	0.53	12.9	0.2 (0.1-0.4)**
GP status	0.9	0.4	5.2	2.5 (1.1-5.4)*
Intention	0.4	0.07	30.9	1.5 (1.3-1.7)**
Attitudes	<-0.1	0.05	0.2	1.0 (0.9-1.1)
Subjective norms	<0.1	0.06	0.2	1.0 (0.9-1.1)
Perceived behavioural control	<-0.1	0.07	0.2	1.0 (0.8-1.1)
Past behaviour	0.1	0.05	8.3	1.2 (1.0-1.3)**
Knowledge	-0.4	0.29	1.8	0.7 (0.4-1.2)
<i>HBM Step One</i>				
Age group	-0.5	0.28	2.6	0.6 (0.4-1.1)
GP status	1.5	0.30	24.2	4.3 (2.4-7.7)**
<i>HBM Step Two</i>				
Age group	-1	0.38	6.6	0.4 (0.2-0.8)*
GP status	0.9	0.41	4.9	2.5 (1.1-5.5)*
Intention	0.4	0.06	45.8	1.5 (1.3-1.7)**
Benefits	<-0.1	0.06	2.1	0.9 (0.8-1.0)
Susceptibility	<0.1	0.05	1.0	1.0 (0.9-1.2)
Severity	<-0.1	0.06	1.9	0.9 (0.8-1.0)
Self-efficacy	0.1	0.05	4.8	1.1 (1.0-1.2)*
Barriers	<0.1	0.08	0.2	1.0 (0.9-1.2)

6.4 Discussion

The aim of Study 3 was to compare the TPB and HBM for their utility in predicting cervical screening intentions and behaviour, as well as to evaluate two of the components of the IBM, an expansion of the TPB. In line with the study hypothesis, the TPB was shown to predict greater variance in women's intention to screen than the HBM, although the TPB (along with the two IBM variables) and HBM predicted the same proportion of variance in screening behaviour. The TPB variables of attitudes and perceived behavioural control were both predictors of intention to screen, with attitudes predicting a greater amount of variance ($\beta = 0.63$) than perceived behavioural control ($\beta = 0.19$). In addition, intention to screen and past screening behaviour both predicted recent screening behaviour. In the HBM, perceived benefits, susceptibility, severity and self-efficacy all predicted screening intentions, with the screening benefits predicting the greatest amount of variance ($\beta = 0.37$). However, only intentions and self-efficacy predicted screening behaviour. Having a regular GP was a significant predictor of intention to screen and screening behaviour in both models, and predicted a greater amount of variance than intentions to screen.

Most prior studies of the HBM in the context of cervical screening evaluated intention to screen, but not actually screening behaviour. These have predicted limited variance, for example, 4% (Bish et al., 2000) to 30% (Hill et al., 1985), which may be due to differences in the number of variables included in the model, or because of differences in the time frames used. For example, the study by Bish and colleagues (2000) asked women to rate their intention to screen in the next three months, whereas Hill and colleagues (1985) asked women to rate intention over the next two years. In Study 3, a two-year time frame was also used, though a greater proportion of variance was predicted (49%). This may be due to the inclusion of self-efficacy in this study. With regards to behaviour, Burak (1997) found that the HBM predicted 15% of the variance in recent screening behaviour, which is less than this study. Again, this may be explained by the difference in model variables and covariates included in their study (e.g. cues to action

but not self-efficacy). The results from Study 3 suggest that self-efficacy is a particularly useful component of the HBM, though it is not included in many studies (Carpenter, 2010). Research evaluating *Protection Motivation Theory* has also implicated self-efficacy as an important predictor of health behaviour (Floyd et al., 2000), adding weight to the suggestion that this variable is a useful addition to the HBM.

Similarly, with regards to the TPB, Study 3 predicted a greater proportion of variance in intentions to perform the health behaviour (58%) than the existing literature. Meta-analyses of the TPB and TRA suggested that these models accounted for 39–41% of the variance in intentions (Armitage & Conner, 2001; Godin & Kok, 1996). However, the 37% variation in screening behaviour predicted in this study is more consistent with 27–34% of variance in behaviour calculated in these meta-analyses. Regarding specific model variables, a meta-analysis of the TRA and TPB in predicting cancer screening behaviour found that perceived behavioural control was a strong predictor of intentions (Cooke & French, 2008), although in this study, attitudes to screening was predicted the greatest amount of variance in intentions ($\beta = 0.63$). Meta-analysis of the utility of TPB in predicting cervical screening suggests only a small to moderate correlation between intentions and behaviour ($r = .21$; Cooke & French, 2008), although this relationship was much stronger in this study. This disparate result is likely due to the assessment of recent screening behaviour rather than future screening behaviour.

The hypothesis relating to the IBM was only partially supported. Past behaviour was found to be a significant predictor of screening behaviour, which is not surprising given the strong relationship between past and future behaviour (Conner & Armitage, 1998). Women's past experiences of screening may influence their behaviour by exposing them to situations that shape their beliefs in the future or which results in the screening becoming habitual (Ouellette & Wood, 1998). However, knowledge of the salient aspects of screening guidelines was not a significant predictor of screening behaviour. This is likely due to the use of only two questions. However, knowledge of the salient aspects of the screening guidelines was not a significant predictor of screening behaviour. This is

likely due to the use of only two questions. It is also possible that a better test of women's knowledge was related to the purpose of the screening rather than the guidelines for screening. Thus, future research in this area should assess women's screening knowledge in a more comprehensive and relevant manner.

While intention is a reliable predictor of behaviour in the HBM and TPB, neither is able to explain why women with high levels of intentions to screen may not end up doing so (Sheeran, 2002; Sheeran & Orbell, 2000; Webb & Sheeran, 2006). This *intention-behaviour gap* highlights the existence of factors other than intentions in influencing health behaviours. While the IBM seeks to account for some of these, stage models of health behaviour such as the Health Action Process Approach, which posits that a volitional phase exists between intentions and behaviour, may be a useful way to bridge this gap. However, stage models have not been studied extensively, especially in the field of cancer screening (Luszczynska et al., 2011).

In Study 3, having a regular GP was included as a covariate in all models, and it predicted the greatest amount of variance in screening intentions and behaviour. Engagement with GPs has previously been identified as an important facilitator to screening (Ashok et al., 2012; Black et al., 2011; Mandelblatt et al., 1999), highlighting the critical role of the relationship with health professionals. However, as only cross-sectional analyses were examined in this study, it is unclear whether GPs influence women's screening behaviour or whether women with positive attitudes to preventative health are more likely to engage with a regular GP. Future research should therefore be directed towards better understanding the relationship between engagement with GPs, model variables and screening behaviour.

Finally, much of the research in the area of cervical screening has focussed on barriers and facilitators to screening, rather than the broader range of variables indicated by social-cognitive theories, including the HBM and TPB. In Study 2, the number of practical and psychological barriers cited by the women accounted for only 7% of the

variance in recent screening behaviour, which is far less than the variance explained by models (37%) in this study. This may be due to the fact that our analysis only measured the number of barriers cited, without analysing the nature of the barriers and the extent to which women felt they had each influenced behaviour. That is, the discrepancy between barriers and the model variables may not have been so substantial if the content of the barriers had been analysed rather than the number of them reported. However, coding the content of the barriers using quantitative analytic methods would have been too time-consuming and was outside the scope of this project. While the models in this study did include covariates that were significant predictors of behaviour that increased the amount of variance explained, meta-analytic evidence discussed above suggests the models still account for a greater proportion of variance than explained by barriers (Armitage & Conner, 2001; Burak & Meyer, 1997; Godin & Kok, 1996; Hill et al., 1985). Thus, although the models do not offer a full account of the factors that may influence screening attendance, they are likely to provide a stronger empirical basis for examining interventions to promote screening than barriers and facilitators.

Several study limitations may have impacted on the validity of the results of Study 3. First, the sample was restricted in terms of age, such that two distinct age samples were surveyed, limiting the generalisability of the results. Additionally, the perceived benefits variable with the HBM had only adequate internal consistency. Evaluation of the knowledge variable also could have been improved with a more comprehensive measure, as previously discussed. Finally, a number of limitations pertaining to Study 2 are also relevant to these results. As the survey was cross-sectional in nature it was not possible to make inferences about causality. Further, this resulted in the collection of past screening behaviour which may have been subject to recall bias, and also future intentions were used to predict current behaviour. Finally, a high proportion of the sample reported having some tertiary education, which is likely a result of the study being conducted online (Howard et al., 2001) and may limit relevance of the findings to other demographics.

6.4.1 Conclusions.

In Study 3, while the *Theory of Planned Behaviour* variables were shown to explain greater variance in cervical screening intentions than the *Health Belief Model*, the models predicted the same proportion of variance in screening behaviour. One *Integrated Behavioural Model* variable, past behaviour, was a significant predictor in the model, although a more comprehensive assessment of the IBM variables and their ability to predict screening behaviour is required. However, having a regular GP predicted the greatest amount of variance in screening behaviour, once again implicating these doctors as having an important role in increasing screening uptake.

7. General Discussion

7.1 Summary of Results

Despite the documented low and declining rates of cervical screening among young women (Lancucki et al., 2010), there is a paucity of research exploring the factors that influence their screening attendance, especially those who have never screened before. More generally, the screening literature is limited by a lack of quantitative studies and the current focus on barriers and facilitators to screening, rather than utilising social-cognitive models of health behaviour. Hence, the broad aim of the research described in this thesis was to better understand the reasons why young women are less likely to attend cervical cancer screening.

Study 1 was a qualitative study that involved collecting interview data from 20 women who were regular screeners, were overdue for screening or had never screened before. This study aimed to explore young Australian's women's screening experiences and the barriers and facilitators they encountered to screening using thematic analysis. The aim of Study 2 was to use quantitative data to test the findings obtained from Study 1. In this study, data was collected from 338 women who completed an online survey. The study aimed to evaluate the extent to which the barriers and facilitators the women had nominated were associated with actual screening behaviour, and it compared whether practical or psychological factors were more influential in predicting screening behaviour. Study 3 aimed to compare the ability of the TPB and HBM in predicting cervical cancer screening intentions and screening behaviour, using the data obtained from Study 2. It also sought to evaluate whether the variables included in the IBM may be useful in better understanding cervical screening behaviour. The preceding chapters sought to examine three broad research questions: which screening barriers and facilitators had most strongly influenced cervical screening behaviour in young women; whether the factors differed between the women who had and had not screened before; and whether social-cognitive models of health behaviour can provide a better account of the factors

that likely influence screening behaviours than the analysis of screening barriers and facilitators.

The first research question was examined in Studies 1 and 2, with these studies seeking to understand which barriers and facilitators most strongly influenced women's screening behaviour. This research question also relates to the second mixed methods research question outlined in Chapter 3, which was to determine the extent to which the quantitative results confirm the qualitative results.

Results from the qualitative study (Study 1) identified that young women who had screened previously believed that practical factors were the most important barriers to screening, more so than psychological factors. Practical barriers that the women listed included a lack of time, difficulty in scheduling the screening appointment, and an inconvenient clinic location. Consistent with this result, in Study 2, the most commonly nominated barrier by women was a lack of time. However, when the relationship between barriers and screening attendance was analysed quantitatively in Study 2, only the number of psychological (not practical) barriers predicted the women's screening attendance, and young women were more likely to report such psychological barriers than middle-aged women. A similar discrepancy was apparent in relation to the relationship with screening facilitators. In Study 1, women nominated practical facilitators which made it easier for them to screen, including walk-in screening clinics, reminders to screen, and the opportunity to screen at a GP appointment for another medical problem. However, in Study 2, with the exception of low-cost tests, the screening facilitators were not shown to be associated with timely screening attendance.

There are a number of possible reasons for the discrepancy between the findings in Study 1 and 2. First, Study 1 interviewed a small number of young women from a particular region and it is possible that their views differed to those of Australian women generally. Second, it is also important to consider the context of different methodologies when evaluating mixed methods findings (Wagner et al., 2012). Data from face-to-face

interviews can yield more socially desirable responses than self-administered surveys (Kreuter, Presser, & Tourangeau, 2008). For example, the women may have hid their negative emotional responses to screening in a one-on-one interview with the researcher, relative to an anonymous online setting. Third, analysis of the qualitative data sought to understand women's own understanding of the barriers and facilitators that impacted on their own screening behaviour, and they may not have consciously accessed and reported on their attitudes or noticed the relationship between them and their screening attendance (Wilson & Dunn, 2004). This explanation is consistent with the fact that the most commonly endorsed barrier in both studies was a lack of time, although this was not related to screening attendance when the association was tested quantitatively. The discrepant results between Studies 1 and 2 highlights the importance of building on self-report data by evaluating the extent to which women's self-reported attitudes are actually associated with screening behaviour. Taken together, the results of Study 1 and 2 suggest that the screening barriers the women nominated as being most important did not actually predict their screening behaviour. Results from Study 2 suggested that psychological barriers nominated by women were more strongly associated with screening non-attendance, rather than practical barriers. Young women tended to report a greater number of these psychological barriers than middle-aged women and, as detailed below, this may be one factor that influenced their lower rates of screening.

Psychological barriers implicated in this research (i.e. embarrassment, anxiety, and distress associated with pain/discomfort) have been previously identified in studies of women at all screening ages (Armstrong et al., 2012; Nathoo, 1988; Oscarsson, 2011). However, much of the prior literature is qualitative in nature and the strength of the relationship of the barriers and screening is unclear. Prior quantitative studies have suggested that practical barriers to screening are more strongly related to timely screening attendance than psychological ones (Eaker et al., 2001b; Waller et al., 2009). Further, a qualitative study comparing young and middle-aged women concluded that young women were more likely to experience practical barriers than middle-aged women. Results from

Study 1 are consistent with these findings. However, psychological barriers were more strongly associated with screening behaviour in Study 2. It is unclear whether this discrepancy reflects salient differences between health services provision in Europe and Australia or is due to methodological differences between the studies.

The second research question, which was related to whether the barriers and facilitators differed based on screening history, was also addressed in Studies 1 and 2. In particular, the studies addressed whether low screening rates in young women were the result of unique barriers to *first* screening attendance, relative to women who had screened before. Study 1 examined women's reflections of their first and subsequent screening experiences, or it examined why they had not screened before. Women who had not screened before reported that psychological barriers and facilitators were more salient than potential practical barriers, although they also reported significant knowledge gaps related to the screening; for example, failing to understand why the screening should be conducted. Similarly, the women who had screened before felt that their first screening experience was anxiety-provoking but they benefited from the emotional support provided by the doctor conducting the test. Further, they suggested that it was a lack of familiarity with the screening procedure that led them to experience anxiety during the first screening experience, and this was reiterated by the women who had not yet screened.

In this regard, the results of Study 1 were supported by the findings in Study 2, which tested the relationship between screening history and the types of barriers and facilitators the women endorsed. Results indicated that the women who had never screened before reported more psychological screening barriers than the women who had screened before, in particular, anticipatory anxiety and distress related to the pain of the procedure. In contrast, they reported fewer practical barriers, especially a lack of time to do the test. Taken together, the results likely reflect that when women undergo this intimate procedure for the first time, they expect to experience anxiety and possible distress. However, first time screeners are not likely to be familiar with the logistical requirements of attending the screening appointment, and so they are likely unaware of

the possible practical barriers to screening. To date, these are the first two studies to evaluate whether women who have not screened before have different needs to the women who have previously experienced the procedure. Results from Studies 1 and 2 suggest that greater emotional support may be required to address the psychological barriers to screening (e.g. anxiety and discomfort during the procedure) that may prevent some women from screening for the first time.

As discussed in Chapter 2, there is little research exploring the perspectives of women who have never screened before, and no study has previously compared the needs of women based on their screening history. Nonetheless, the results of these studies are consistent with literature findings related to the women who have not screened before or in which psychological barriers such as worry, knowledge gaps and negative attitudes to the test are implicated (Al-Naggar et al., 2010; Wong et al., 2008).

The third research question, which was to evaluate whether social-cognitive models of health behaviour provided a better account of factors influencing screening behaviour than analysis of barriers and facilitators, was addressed by comparing the results of Studies 2 and 3. As discussed in Chapter 2, the literature related to cervical screening has so far focussed on the barriers and facilitators to screening rather than the social-cognitive models of health behaviour, to help explain the factors that are likely to influence screening attendance. Figure 7.1 summarises the significant predictors of screening intentions and behaviour identified in Study 3. The results of Study 2 indicated that the number of screening barriers nominated by the women predicted only a small amount of the variance in timely screening attendance (7%), whereas the number of facilitators did not predict screening attendance. In contrast, in Study 3, analysis of the *Health Belief Model* and the *Theory of Planned Behaviour* indicated that both models predicted a greater amount of variance in screening behaviour (37%). Thus, the models predicted substantially more variance in screening behaviour than the analysis of number of screening barriers and facilitators endorsed. This is not surprising, given analysis of barriers and facilitators relies on women's awareness of the factors influencing their

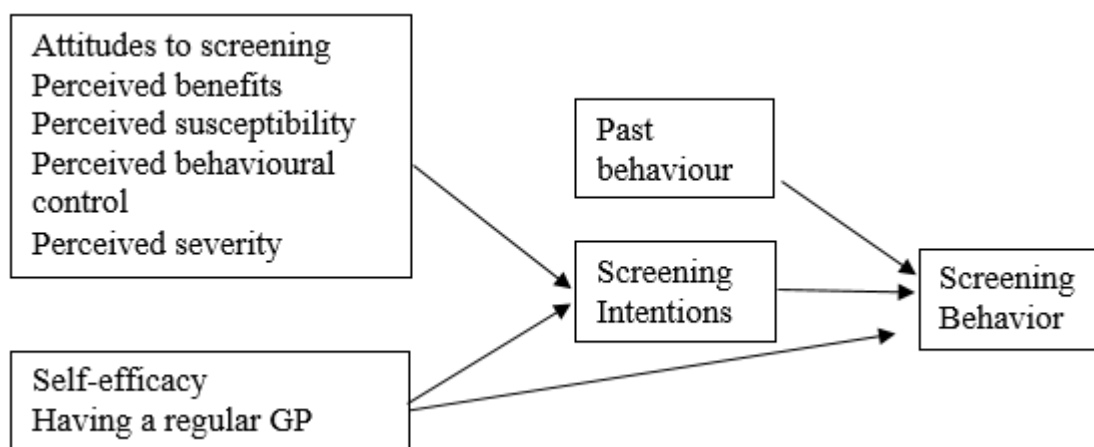


Figure 7.1. Predictors of screening intentions and cervical screening behaviour identified in Study 3.

behaviour. It is unlikely that individuals will have conscious insight into psychological factors known to influence health behaviour, such as their perceived self-efficacy to perform a health behaviour or susceptibility to a disease. As discussed in Chapter 6, the amount of variance predicted by the HBM and TPB in Study 3 was higher than other estimates in the literature (Armitage & Conner, 2001; Carpenter, 2010), likely due to the inclusion of additional model variables and cross-sectional design. In particular, the broader literature suggests the HBM is less successful than other models in predicting future behaviour (Carpenter, 2010; Harrison et al., 1992). However, with regards to the TPB, even lower estimates of the amount of variance explained (e.g. 27%; Armitage & Conner, 2001) are considerably more than the 7% explained by the number of barriers in Study 2.

Given much of the literature relating to barriers and facilitators is qualitative, it is difficult to identify whether results from Study 2 that found barriers accounted for a small proportion of variance in screening behaviour is consistent with past literature. Additionally, the quantitative studies relating to barriers and facilitators have not reported *R*-square estimates for their models (Eaker et al., 2001a; Waller et al., 2009).

7.1.1 The role of GPs in facilitating screening attendance.

Understanding the role of GPs in facilitating screening attendance was not an *a priori* aim of this research. However, in Study 1 a key finding was that women felt that having a regular GP facilitated their screening attendance and they conceptualised screening as one component of routine primary health care. In fact, all the women who reported having a regular GP were also up to date with their cervical screening in Study 1, whereas none of the overdue screeners reported having a regular GP. However, having a regular GP was not often nominated by women as a screening facilitator in the study. Hence, this finding was examined in greater detail in Study 2. Having a regular GP was shown to be significantly associated with timely screening attendance, and with having ever attended cervical screening. In Study 2, young women were less likely than middle-aged women to have a regular GP, consistent with national Australian statistics which indicate that women aged 25-34 years are less likely to report having a regular GP than women aged 45-54 (ABS, 2015). Hence, this factor may partly explain the lower screening rates in young women.

The importance of GPs in promoting women's screening is highlighted by comparing the strength of this association relative to others, such as screening barriers and facilitators and the social-cognitive model variables. In Study 2, not having a regular GP was much more strongly associated with being overdue for screening than psychological or practical barrier scores. In Study 3, having a regular GP was a stronger predictor of recent screening behaviour than intention to screen in logistic regression models. Qualitatively, in Study 1, several women articulated that their GP was the most important determinant of whether they were up to date with screening or not.

However, given the cross-sectional nature of the studies, a causal relationship cannot be inferred between having a regular GP and regular cervical screening attendance. This significant relationship may simply reflect that the women with a strong motivation to screen regularly may be most likely to hold proactive attitudes towards

health and regular GP attendance. Nonetheless, regular screeners interviewed in Study 1 did have poor knowledge of the cervical screening requirements and expressed that they were generally reliant on their GP to schedule the test at the appropriate time, suggesting that regular screening occurred because of their engagement with the GP, at least in some women.

A strength of the results from Studies 1 and 2 is that they may offer insight into *how* a regular GP can facilitate cervical screening. In Study 1, women identified that their GPs could assist them in screening by asking if they would like the test performed during an appointment for another medical reason. In addition, the women's knowledge of the purpose and rationale for the screening was often poor in women who had screened many times before. Further, doctors were acknowledged as a source of emotional support during the first screening experience.

These findings were partially supported by the results of Study 2, which indicated that the women with a regular GP reported fewer psychological barriers to screening, especially anxiety about the test or test results. However, they did not report experiencing fewer practical facilitators such as GP reminders to screen. Thus, further research is needed to explain how GPs reduce psychological barriers to screening, especially in young women. Nonetheless, it is likely that an established relationship with a doctor can reduce women's anxiety during this intimate procedure and more easily detect the women who experience distress and remedy the problem.

Numerous studies have previously reported that engagement with health services is associated with greater screening attendance (Ashok et al., 2012; Black et al., 2011; Eaker et al., 2001a). However, there is less research examining how primary health care physicians influence screening behaviour (O'Connor et al., 2014), and whether this accounts for the lower screening rates in certain groups such as young women. In their qualitative study of young women, Black and colleagues (2011) noted that some women had difficulty in establishing a regular relationship with a GP due to moving residence,

but it is unclear whether this factor is unique to young women. In another qualitative study, health professionals believed that the tendency of young women to move house and subsequently disengage from their usual GP was a barrier to screening, but this was not reported by the women themselves (Waller et al., 2011). Thus, the results of Studies 1 and 2 add weight to the conclusion that assisting young women to access primary health care may help to address the lower screening rates in this age group (Black et al., 2011).

As discussed in Chapter 2, knowledge barriers to screening are widespread, and reviews of the efficacy of interventions suggest that education campaigns are less successful than physician recommendations and prompts to screen (Brouwers et al., 2011; Marcus & Crane, 1998; Yabroff et al., 2003). This finding adds weight to the results of Study 1 which suggest that even the women who screen regularly are not driven by an informed understanding of the benefits of the screening; rather, they are most likely to screen because of the doctor's recommendation.

7.2 Theoretical Implications

The findings of Study 3 suggest that social-cognitive models of health behaviour provide a useful account of the factors influencing cervical screening intentions and, to a lesser extent, behaviour. Regarding the HBM, self-efficacy was identified as a strong predictor of intentions and the only model variable that predicted behaviour. However, many studies do not include self-efficacy in research evaluating the utility of the HBM (Carpenter, 2010), and this may explain why this has tended to explain less variance in screening behaviour than the TPB. Future research on the HBM should include this important model variable.

As discussed in Chapter 6, while intentions to screen were a significant predictor of screening behaviour, there is a considerable proportion of variance in behaviour that is not accounted for. Alternate models have been developed in recent years that may help bridge the *intention-behaviour gap*, by considering additional factors that influence behaviour following the formation of an intention to screen. Known as *stage models*,

these not only describe factors that increase intention to perform a health behaviour but also aim to account for how intentions are turned into behaviour. For example, the *Transtheoretical Model* (Prochaska, DiClemente, & Norcross, 1992) outlines a number of stages that precede engagement with a health behaviour, including contemplating a decision to change behaviour and preparation to do so. The *Health Action Process Approach* (Schwarzer, 1992) is another stage theory of health behaviour that aims to address the intention behaviour gap. This model suggests that in addition to a motivational phase that leads to developing intentions (as captured by traditional social-cognitive models of health behaviour), a volitional phase occurs between intentions and behaviour. However, as few longitudinal studies have been conducted to evaluate the validity and utility of these models, more research is needed to determine how these compare to traditional social-cognitive models (Sutton, 2007).

In line with the findings of this research, another factor that may extend theoretical understanding of screening behaviour is women's interactions with primary health care. Though some iterations of the HBM include *cues to action*, and *Protection Motivation Theory* also posits that *sources of information* may influence the psychological determinants of intention to screen, these are not major components of the models and have been understudied (Carpenter, 2010). While this may be appropriate when models are used to explain behaviour such as smoking cessation and exercise, interactions with medical professionals are certainly more relevant for health behaviours that are administered by a clinician. The results from this thesis that link having a regular GP with fewer psychological barriers suggest that GPs provide more than a prompt or cue to engage in screening. In line with stage models, it is possible that GPs influence screening at multiple points of the screening process, such as providing education about screening and tracking when screening is due, reducing negative emotional responses to screening and providing opportunistic screening. A better understanding of how relationships with GPs influence screening could inform more comprehensive models of screening behaviour that account for the significant role that clinicians play for behaviour

involving medical procedures.

7.3 Health Promotion and Policy Implications

Australia is set to introduce changes to its NCSP in 2017. Health promotion workers will soon be looking for ways to help inform young and older women of these changes and to encourage them to engage with the new screening processes. As detailed below, the findings obtained in Studies 1 to 3 have implications for the best approach to the promotion of screening in young women under the new NCSP.

Promotion of cervical screening has been shown to be more effective when it is targeted at the audience (e.g. a particular age group) rather than providing a general message to all women (Luszczynska et al., 2011; Yabroff et al., 2003). Results from Study 2 suggest that young women are more likely to report psychological barriers which need to be addressed, in order to increase screening uptake. Some women in Study 1 indicated that electronic reminders (i.e. emails, smartphone apps and text messages) may be a more useful way to target young women than mail letters. However, results from Study 2 and 3 suggest that when tailoring a promotion to young women, it may be more effective to base the interventions on social-cognitive models of health behaviour than simply addressing the screening barriers and facilitators. Additionally, with regards to young women, it may be most cost effective to encourage them to engage with a regular GP than to address particular screening barriers, especially since doctors provide a range of other possible preventive health measures, including skin checks and breast examination. However, a particular challenge with regards to encouraging young women to develop a relationship with a GP is the absence of health problems and frequent change of residence.

Finally, the results from the thesis may have implications for the design of invitation letters to be sent to young women as they are turning 25 years, under the new NCSP. For example, the invitation letter should include a greater focus on the possible psychological concerns and knowledge gaps related to the procedure, including the provision of information about the screening and how it is conducted and reassuring them

that the procedure should not cause significant pain, just mild discomfort.

7.4 Clinical Implications

A consistent finding across this body of research work is that primary health care physicians play an important role in facilitating the uptake of cervical screening. For example, women tended to see the screening as a routine part of primary health care and, in some cases, deferred responsibility to the GP to keep track of when they were due for testing, even when attending a consultation for another health concern. A consistent finding across this body of research is that primary health care physicians play an important role in facilitating the uptake of cervical screening. For example, Australian women tended to see the screening as a routine part of primary health care and, in some cases, deferred responsibility to the GP to keep track of when they were due for the testing, even when they attended the doctor for another health concern. However, it should be acknowledged that health professionals other than doctors including nurses, midwives, and gynaecologists also commonly conduct cervical screening, especially in countries where cervical screening programs are not delivered by primary care physicians. Nonetheless, the GP findings may have implications for other health professionals. For example, having a regular health provider may facilitate screening uptake via the ongoing relationship with the provider, which may tend to reduce the perception of psychological barriers and provide a means of keeping track of when the procedures are due.

Findings from Study 3 also highlight that the social-cognitive model variables likely influence women's intentions to screen. Health professionals might consider addressing these factors in the future by providing the women with information on the efficacy of screening, and on younger women's susceptibility to contract HPV and develop CIN lesions (AIHW, 2016), to increase the women's intentions to screen.

Although relying on health professionals to initiate the screening appears to be an effective way to promote uptake of the procedure, this has recently raised concerns about whether the women are making an informed choice to undergo the test. This was

highlighted in Study 1, where it appeared that some women screened out of a sense of obligation to comply with a doctor's recommendation. Williams and colleagues (2014) highlight the ethical tension between the promotion of screening uptake and ensuring that there is informed consent to participate in the screening. This message was echoed in a recent qualitative study of health professionals, in which it was noted that some staff could take a paternalistic or coercive approach to encouraging the women to screen (Waller et al., 2011). Thus, although the time-constraints on GPs are well documented (Mazza et al., 2011), doctors are encouraged to provide balanced information to women about the screening, rather than persuading or coercing them to undertake screening. In line with this, other qualitative studies have found that women feel a sense of obligation or duty to participate in national screening programs (Bush, 2000; Whynes, Philips, & Avis, 2007).

Finally, health professionals should be mindful that the psychological issues raised by women, such as embarrassment and anxiety about the test and test results, may be more problematic than women explicitly acknowledge. In particular, young women and those who have never screened before may require the provision of emotional support from the health professional during the procedure.

7.5 Future Directions

The findings of this series of studies highlight a number of future directions for research on cervical cancer screening. In this thesis, factors such as engagement with GPs and psychological barriers are implicated as possible explanations for young women's lower screening rates. However, longitudinal research is required to determine whether this is the case. Furthermore, the implementation of the new NCSP in Australia in May 2017 opens up a number of important directions for future research, which will likely have international relevance as many countries are seeking to replace the Pap tests with HPV tests in coming years (Arbyn et al., 2012), and there has already been research pre-empting this. For example, the Compass Trial is currently evaluating clinical outcomes of HPV testing (Victorian Cytology Service, 2016), and other research has

evaluated the psychological impact of HPV testing (McCaffery, Waller, Nazroo, & Wardle, 2006), and the acceptability of self-administered HPV tests (Dzuba et al., 2002). However, a number of research areas remain unexplored. For example, a key benefit of HPV testing is that the screening occurs less frequently, which has obvious economic benefits. Nonetheless, the much longer 5-year screening interval will tend to make women more reliant on reminders to screen. There is some evidence that reminder letters are an effective intervention in increasing the uptake of screening (Albrow et al., 2014; Everett et al., 2011); however, electronic reminders may be preferred, especially by young women who might be more likely to change residence and GP during the longer screening interval.

Furthermore, for the first time the Australian NCSP will send invitation letters to all young women as they turn 25 years old. Some preliminary research has been conducted to determine the most effective way to encourage them to attend the screening for the first time (Sadler et al., 2013), and as the results of this thesis provide some reasonable suggestions, this is certainly an avenue for future research work. As previously discussed, invitations and other interventions that have a theoretical basis are likely to be more effective than invitations addressing barriers and facilitators alone.

7.6 Limitations of the Research

Specific study limitations that may have reduced the veracity and generalisability of the study results have been discussed in Chapters 4 to 6. However, some limitations pertain to the research as a whole. First, as discussed above, the study was cross-sectional in nature therefore no inferences about causation can be made. Second, screening behaviour was measured using the women's own self-reports rather than verification by the cervical screening registries. Research suggests that women's self-reports of Pap testing may tend to underestimate the number of women who are overdue for screening, relative to registry records (Bowman, Redman, Dickinson, Gibberd, & Sanson-Fisher, 1991). This is not surprising given that women's self-reports rely on their memory of past

events, in particular, their memory of a particular test being conducted several years ago. However, much of the research in this field relies on self-report data due to the difficulty in accessing and linking the participant's medical records together with questionnaire-based data.

Of the participants in Studies 2 and 3, 72% of the women reported being up to date with screening, considerably higher than the 58% of Australian women documented in the general population (AIHW, 2016). It is likely that this sample was biased towards women who were up to date with screening, as some research indicates that non-responders to health surveys tend to have poorer health than the responders (Etter & Perneger, 1997). In both the qualitative and quantitative studies, a high level of educational attainment was noted, and this may have influenced the higher screening rate as education level and screening uptake are positively associated (Breslow, Sorkin, Frey, & Kessler, 1997). Finally, young women in Study 2 were not more likely to be overdue for screening than the middle-aged women, as indicated by recent Australian national statistics (AIHW, 2016). Thus, future research is needed that uses stratified sampling to target women who are overdue for screening.

7.7 Strengths of the Research

Despite the limitations, the research presented in this thesis had a number of strengths. The mixed methods research framework complemented the existing literature, which is both quantitative and qualitative in nature. The quantitative Study 2 adds to the small body of literature testing associations between barriers, facilitators and screening attendance. The qualitative Study 1 also informed the development and analysis of Study 2 and it also helped to elaborate on and explain the findings of Study 2. Further, as discussed in Chapter 2, an association between age and screening uptake has previously been identified, although most studies looked at screening across different ages but did not focus on the needs of young women (Sadler et al., 2013), or they just examined young women, and did not compare them to older women. To date, no other quantitative study

has evaluated the potential differences in the factors influencing screening attendance, according to age group. Finally, by evaluating the needs of the women who have not screened before, this research study has also addressed an identified gap in the literature (Chorley et al., 2016). A small number of studies have examined the needs of women who have not screened before (Al-Naggar et al., 2010; Orbell & Sheeran, 1998; Wong et al., 2008). However, by comparing the women who have and had not screened in a quantitative study, the relative needs of this group could be identified.

7.8 Conclusions

This thesis contributes to the small psychological literature that examines young women's attitudes to cervical screening, as Australia moves into the new era in cervical cancer prevention. The main strength of this thesis is the comparison of screening barriers and facilitators, intentions and screening behaviour in young and middle-aged women and in women with different screening histories. Studies 1 and 2 are the first studies to identify that the first experience of screening in women is often associated with strong psychological barriers to screening, which may require a different approach to promoting the screening. That is, the lower screening rates in young Australian women may reflect the difficulty in getting them to attend screening for the first time.

The results of Study 3 highlight that although theory-based approaches have not been widely used in the recent literature on cervical screening, the variables included in the social-cognitive models may offer a more comprehensive explanation of the factors that likely influence screening intentions and behaviour, than screening barriers and facilitators. However, of all the factors studied, having a regular GP was the most consistent predictor of timely screening attendance. Young women were less likely to have a regular GP and this may help to explain why they have lower screening rates than older women. Thus, instead of promoting cervical screening and other specific preventive health procedures for women, it may be more efficient to encourage them to engage with a regular GP, since they can be effective in facilitating the timely adherence to screening.

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Appendix A: Study One Advertisement



We are looking for **women aged 25-35 who are fluent in English** to help us with a study about cervical cancer screening. Participants in the study will undertake an interview with questions about their attitudes to cervical cancer screening. It is expected that this interview will take between 30 and 45minutes.

Participants can choose either a



as a reward for completing the study.

To sign up the study or for more information about this study, please call, text or email Tanya:

0430 348 241 or tanya.muller@anu.edu.au



Appendix B: Study One Participant Information Sheet



Participant Information Sheet

Researcher:

This research is being conducted by Ms Tanya Muller, a postgraduate student in the Research School of Psychology, College of Medicine, Biology and Environment. This project is being conducted under the supervision of Associate Professor Rhonda Brown and Dr Anna Olsen.

Project Title: Understanding Cervical Cancer Screening Amongst Young Women

General Outline of the Project:

This project seeks to understand young women's attitudes towards cervical cancer screening. This part of the project is a qualitative study based on interview data from approximately 20 women aged 25-35 living in the Canberra region. The interview data will form the basis of publications in peer-reviewed journals and will form the basis of Ms Tanya Muller's doctoral thesis. Results from this study will also be used to inform further quantitative research conducted by Ms Muller.

Participant Involvement:

Participation in this study is completely voluntary and you are not under any obligation to consent. You will be able to continue your participation in this study even if you choose not to answer some questions. You may withdraw from the study at any point. If you do choose to withdraw, your data will be destroyed.

The interview will take place at a location of the participant's choosing. It is expected that the interview will last 30-45 minutes. Participants in this study will be asked to undertake a one on one interview with the researcher. Participants will be asked some general questions about themselves and their health, and their attitudes to cervical cancer screening.

This interview will be recorded (audio only) so that it can be transcribed for analysis. Recording will only commence after consent is given from participants. On request, participants will be given a copy of their transcript before analysis is finalised.

Participants can choose between receiving a \$20 Coles-Myer gift voucher, or a movie ticket after participating in the study.

There are no significant risks associated with participating in this study. Participants may feel concerned about their health through participating in the study, but all participants will be provided with an information sheet about cervical cancer screening and will be referred to relevant services (e.g., the ANU Health Service) for more information about screening.

Inclusion criteria:

Females aged 25-35 who are fluent in English are eligible for this study.

Confidentiality:

Data will be kept confidential as far as the law allows. Only the researchers will have access to information on participants, and data will never be stored with information that could identify participants. Results from the study may be submitted for publication, but no participant will be identifiable in these publications.



Data Storage:

Audio files will be deleted after transcription is complete. Data will be stored on a password protected computer at the ANU. In accordance to ANU guidelines, data will be stored for five years after the study has finished.

Queries and Concerns:

If you require further information or have any questions, please contact Ms Tanya Muller.

Tanya Muller
Mobile: 0430 348 241
Email: tanya.muller@anu.edu.au

Associate Professor Rhonda Brown (Supervisor)
Phone: 6125 0635
Email: rhonda.brown@anu.edu.au

If participating in this study raises any personal questions about cervical cancer screening, please contact your General Practitioner to discuss these on a confidential basis.

Ethics Committee Clearance:

The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee. If you have any concerns or complaints about how this research has been conducted, please contact:

Ethics Manager
The ANU Human Research Ethics Committee
The Australian National University
Telephone: +61 2 6125 3427
Email: Human.Ethics.Officer@anu.edu.au

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Appendix C: Study One Consent Form

Promoting Cervical Cancer Screening Project: Consent Form

I _____ have read and had the information sheet explained to me, and I fully understand the nature of the project and its likely outcomes. I have chosen to participate with full consent. In giving consent I acknowledge that:

- a) The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.
- b) I have read the Participant Information Statement and have been given the opportunity to discuss the information and my involvement in the project with the researcher.
- c) I understand that I can withdraw from the study at any time, without affecting my relationship with the researchers or the Australian National University now or in the future.
- d) I understand that the researchers will hold these materials at the Research School of Psychology at the Australian National University for five years after the completion of the study.
- e) I understand that should I have any personal questions about cervical cancer screening, I should contact my General Practitioner to discuss these on a confidential basis.
- f) I understand that I can retract this consent at any time.

Additionally, I give consent to audio-recording of my interview

YES ☐ NO ☐

SIGNED _____

DATE _____

Appendix D: Study One Interview Schedule

1. What is your age?
2. What is the highest qualification you have obtained? (Year 10 Certificate, Year 12 Certificate, TAFE Certificate/Diploma, University Degree or Postgraduate Degree)
3. Which of the following categories best describes your employment status? (Unemployed, Student, Part-time/Casual or Full-time)
4. What is your relationship status? (Single, In a Relationship, De Facto, Engaged, Married, Divorced, Widowed)
5. Do you have a regular GP?
6. Approximately how many times did you see your GP in the last 12 months?
7. How old were you when you first had sexual intercourse?
8. Have you ever received the HPV vaccine? How many doses did you receive?
9. Have you heard of a Pap test? It's sometimes called a Pap smear or cervical smear. Can you tell me what you know about Pap tests?
10. Do you know if women still need to have Pap tests after having the HPV vaccine? Why?
11. Do you know why women should have Pap tests?
12. Do you know when women need to start having Pap tests?
13. Do you know how often women need to have Pap tests?
14. Can you remember how you first found out about Pap tests?
15. Have you spoken to friends or family members about Pap tests?

For the next set of questions, I'm going to ask you about your own experiences with Pap tests. Just so we're on the same page, I'm going to give you this definition. A Pap test is carried out by a nurse or doctor and is used to screen for early signs of cervical cancer. During a Pap test, an instrument called a speculum is used to part the walls of the vagina to get a clear view of the cervix, then a small sample of cells is taken from the surface of the cervix. This is not the same as a pelvic exam or STD test, although sometimes they are conducted at the same time.

Reassure participant that many women don't know what a Pap test is, if they are concerned they got the previous questions "wrong".

16. Have you had a Pap test before?

If participant has had a Pap test:

17. Can you remember how many you've had, and what year your last one was?
18. What happened the last time you had a Pap test?
19. What is it like getting a Pap test?
20. If you've had more than one Pap test, was the experience of getting your first one different to later pap smears?
21. How will you know when your next Pap test is due? (*Proceed to question 26*)

If never had a Pap test:

- 22. Have you ever thought about having a Pap test? Why?
- 23. Have you ever planned to have one in the past?
- 24. 18. Do you plan to have one in the future?
- 25. 19. Has anyone suggested that you should have one? Who?

All participants:

- 26. What things might make it easier to have a Pap test?
- 27. What things might make it difficult for you to have a Pap test?
- 28. Can you list some health behaviours, like having a Pap test, going to the dentist or getting the flu vaccine that you do or try to do regularly? (*Prompt to use post-it-notes*)
- 29. Could you now order these health behaviours, according to what is your highest priority down to your lowest priority?
- 30. Could you tell me why you've ordered it this way?

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Appendix E: Study Two Advertisement



We are looking for women to help us with a study about attitudes to cervical cancer screening. You are eligible to participate in this study if you meet all of these criteria:

- Female aged 25-35 OR 45-55
 - Fluent in English
 - Currently live in Australia
 - Have had sexual intercourse
- Did NOT participate in an interview with Tanya Muller about cervical cancer screening in 2014-2015

Participants will go into a draw to win one of twelve \$20 Coles-Myer vouchers (1/25 chance of winning a voucher)

To find out more about this study, please call, text or email Tanya:

0430 348 241 or tanya.muller@anu.edu.au

To sign up, please go to this website:

https://anupsych.co1.qualtrics.com/SE/?SID=SV_1HPSu3y4DGcsnr

The ethical aspects of the research have been approved by the ANU Human Research Ethics Committee (Protocol Number: 2015/614)



Australian
National
University

Appendix F: Study Two Participant Information Sheet

Participant Information Sheet

Researcher:

This research is being conducted by Ms Tanya Muller, a postgraduate student in the Research School of Psychology, College of Medicine, Biology and Environment. This project is being conducted under the supervision of Associate Professor Rhonda Brown and Dr Anna Olsen.

Project Title: Understanding Cervical Cancer Screening Amongst Young Women

General Outline of the Project:

- **Description and Methodology:** This project seeks to understand young women's attitudes towards cervical cancer screening. Screening rates amongst young women in Australia are low, and we would like to understand more about why this is the case. We are asking women to complete a questionnaire to find out more about attitudes to cervical cancer screening.
- **Participants:** We are seeking 300 Australian women to complete a questionnaire online.
- **Use of Data and Feedback:** The data will form the basis of publications in peer-reviewed journals and will form the basis of Ms Tanya Muller's doctoral thesis. A summary of findings from this study will be uploaded to a public Dropbox folder in July 2016. This can be accessed through the following link: <https://www.dropbox.com/sh/4r4szb62ww77rtb/AABrcPT6yvQjnBvWGLi-gcxZa?dl=0>

Participant Involvement:

- **Voluntary Participation & Withdrawal:** Participation in this study is completely voluntary and you are not under any obligation to consent. You are welcome to withdraw from the study, however, you are not able to withdraw after you have submitted the survey. This is because we will not be able to identify your completed response in the dataset after it has been completed and submitted. We will delete all data from surveys that were not submitted. This means that if you withdraw from the study prior to submitting the completed questionnaire, your data will be deleted. . You will be able to continue your participation in this study even if you choose not to answer some questions.
- **What does participation in the research entail?** If you choose to participate, you will be asked to complete a questionnaire online. In this questionnaire, you will be asked some questions of a sensitive nature, for example, whether you have had sexual intercourse and whether you have had negative experiences having Pap tests. However, if you do not want to answer these questions, you can or choose not to answer them but continue your participation, or withdraw from the study completely.
- **Location and Duration:** Participation involves completing one questionnaire online, at any location with an internet connection. We expect it will take 20-30 minutes to complete this questionnaire.
- **Remuneration:** After you complete the survey, you will be asked to provide your email address if you would like to be eligible to win a reward for completing the study. This email address will not be stored with your questionnaire responses. Twelve \$20 Coles-Myer vouchers will be allocated to participants who have provided their email address. This means you have a 1 in 25 chance of receiving a voucher. Winners will be chosen at random, by allocating all email addresses a number, and using a random number generator to produce twelve random numbers. The email addresses corresponding to these numbers will be contacted to inform them that they have won a voucher, and request a postal address to send this voucher. If there is no response to this email after one week, another random number will be generated until all gift vouchers have been allocated.

- **Risks:** It is possible that some of the study questions may cause distress; for example, in the case that you have had abnormal Pap test results or have another medical condition. You are encouraged to skip any questions that make you feel distressed. If you do become distressed while completing the study, you should withdraw from the study and contact the researchers who will refer you to an appropriate service to help you manage this distress. . At the end of the study, will be provided with an information sheet about cervical cancer screening and will be referred to relevant medical services for more information about screening. If you feel concerned about your health or would like more information about cervical cancer screening, we encourage you to attend one of these services, or speak to your own General Practitioner.
- **Benefits:** It is unlikely that you will personally benefit from participating in this study, but we expect this research will improve our understanding of attitudes to cervical cancer screening and inform the promotion of cervical cancer screening in the future.

Inclusion criteria:

Participants in this study must meet all of the following criteria:

- Female
- Aged 25-35 OR 45-55 years old
- Fluent in English
- Currently live in Australia
- Have had sexual intercourse
- Did not participate in an interview about cervical cancer screening with Tanya Muller in 2014/2015

If you unsure whether you are eligible for this study, please contact Tanya Muller for clarification.

Confidentiality:

- **Confidentiality:** Confidentiality will be protected as far as the law allows. Only the researchers named on this information sheet will have access to information on participants, and data will never be stored with information that could identify participants, (i.e. the email address provided at the end of the study). Results from the study may be submitted for publication, but no participant will be identifiable as only aggregate data will be published.

Data Storage:

- **Where and how long:** Data will be stored on a password-protected computer at the ANU, without any identifying information. Data will be stored for five years from the date of any publication arising from the research, and will then be destroyed due to the sensitive nature of some questions.

Queries and Concerns:

- **Contact Details for More Information:** If you require further information or have any questions, please contact Ms Tanya Muller or her supervisor, Associate Professor Rhonda Brown.

Tanya Muller
Mobile: 0430 348 241
Email: tanya.muller@anu.edu.au

Associate Professor Rhonda Brown (Supervisor)
Phone: 6125 0635
Email: rhonda.brown@anu.edu.au

If participating in this study raises any personal questions about cervical cancer screening, please contact your General Practitioner to discuss these on a confidential basis.

Ethics Committee Clearance:



The ethical aspects of this research have been approved by the ANU Human Research Ethics Committee. If you have any concerns or complaints about how this research has been conducted, please contact:

Ethics Manager
The ANU Human Research Ethics Committee
The Australian National University
Telephone: +61 2 6125 3427
Email: Human.Ethics.Officer@anu.edu.au

Appendix G: Study Two Questionnaire

Demographic Questions

Please fill out the following information about yourself.

1. How old are you? _____
2. What is your nationality?
3. What state do you reside in?
 - a. New South Wales
 - b. Queensland
 - c. Victoria
 - d. Tasmania
 - e. Western Australia
 - f. South Australia
 - g. Australian Capital Territory
 - h. Northern Territory
4. What is the highest qualification you have obtained?
 - a. Year 10 Certificate
 - b. Year 12 Certificate
 - c. TAFE Certificate/Diploma
 - d. Bachelor's Degree
 - e. Postgraduate Degree
5. Which of the following best describes your employment status?
 - a. Unemployed
 - b. Student
 - c. Part-time/casual
 - d. Full-time
6. What is your current relationship status?
 - a. Single
 - b. In a relationship
 - c. De facto
 - d. Engaged
 - e. Married
 - f. Divorced
 - g. Widowed

7. Do you have a regular GP?
 - a. Yes
 - b. No
8. How many times did you see any GP in the past 12-months? _____
9. Have you ever had sexual intercourse? (Sexual intercourse means having sex with either a male or female).
 - a. Yes
 - b. No
10. How many years ago did you first have sexual intercourse? _____
11. Have any of your family or close friends ever had cervical cancer?
 - a. Yes
 - b. No
12. Have you ever received the human papillomavirus (HPV) vaccine? In Australia, it is also known as Gardasil.
 - a. Yes
 - b. No
13. Have you ever heard of a Pap test (or Pap smear or cervical smear?)
 - a. Yes
 - b. No

At this point, participants will be provided with a description of what a Pap test is, to ensure they are referring to the correct procedure: A Pap test is carried out by a nurse or doctor and is used to screen for early signs of cervical cancer. During a Pap test, an instrument called a speculum is used to part the walls of the vagina to get a clear view of the cervix, then a small sample of cells is taken from the surface of the cervix. This is not the same as a pelvic exam or STD test, though sometimes they are conducted at the same time.

14. Have you ever had a Pap test?
 - a. Yes
 - b. No
15. How many Pap tests have you ever had? _____
16. What year and month was your *last* Pap test?
17. How old were you when you had your *first* Pap test?
18. Have you ever received an *abnormal* Pap test result?
 - a. Yes
 - b. No

19. Has a doctor ever diagnosed you with a gynaecological condition (e.g. cervical cancer, endometriosis, fibroids etc.)?
20. Are you currently using *contraception* that requires a prescription from a doctor? (e.g., oral contraceptive Pill, Implanon, IUD etc.)

Knowledge of Cervical Screening Guidelines

Please answer the following questions about *cervical cancer screening* guidelines. You will have 30-seconds to answer each question. Please select the answer that you think is most correct.

1. According to current Australian guidelines, you should have your first Pap test:
 - a. Never – cervical cancer screening is not required after receiving the HPV vaccine
 - b. After you become sexually active
 - c. After age 18 or 2-years after you become sexually active, whichever comes first
 - d. After age 18 or 2-years after you become sexually active, whichever comes later
 - e. Don't know
2. According to current Australian guidelines, how frequently should you have a Pap test?
 - a. Once per year
 - b. Every two years
 - c. Every five years
 - d. Every ten years
 - e. Don't know

Theory of Planned Behaviour Questionnaire

Please read each of these statements about attitudes to cervical cancer screening, and in each row, indicate which response which best describes your attitude.

Attitudes subscale

Having a Pap test every two years is:

Very important	Important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Unimportant	Very unimportant
Very ineffective	Ineffective	Somewhat ineffective	Neither effective nor ineffective	Somewhat effective	Effective	Very effective

Very beneficial	Beneficial	Somewhat beneficial	Neither beneficial nor harmful	Somewhat harmful	Harmful	Very harmful
Very foolish	Foolish	Somewhat foolish	Neither foolish nor wise	Somewhat wise	Wise	Very wise
Very desirable	Desirable	Somewhat desirable	Neither desirable nor undesirable	Somewhat undesirable	Undesirable	Very undesirable

Subjective norms

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Most of my family thinks I should have a Pap test every two years							
Most of my close friends think I should have a Pap test every two years							
	Very untrue	Untrue	Somewhat untrue	Neither true nor untrue	Somewhat true	True	Very true
Most women have a Pap test every two years							

Perceived behavioural control

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have control over whether or not to have a Pap test every two years							
If I wanted to, I could easily have a Pap test every two years							
It is up to me whether or not I have a Pap test every two years							

Intentions

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
It is important that I have a Pap test every two years							
I am willing to have a Pap test every two years							
I intend to have Pap tests every two years							

Barriers and Facilitators

1. There are lots of things that make it *more difficult* to have a Pap test – we call these *barriers*. We would like you to make a list of these barriers – please list anything that would make it more difficult for you to have a Pap test.
2. Now, please rank these barriers in order of how difficult they would make having a Pap test. This means that at the top of the list are the barriers that are MOST likely to stop you from having a Pap test, and at the bottom of the list are the barriers that are LEAST likely to stop you from having a Pap test.
3. There are also lots of things that make it *easier* to have a Pap test - we call these *facilitators*. We would like you to make a list of these facilitators – please list anything that would make it easier for you to have a Pap test.
4. Now, please rank these barriers in order of how much easier they would make having a Pap test. This means that at the top of the list are the barriers that are MOST likely to help you have a Pap test, and at the bottom of the list are the barriers that are LEAST likely to help you have a Pap test.

Health Belief Model Questionnaire

Please read the following statements about attitudes to cervical cancer screening and select the response which best matches your attitude.

Perceived benefits

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
If I had a Pap test, I would lower my risk of developing cervical cancer							
If I had a Pap test, it would give me peace of mind about my health							
If I had a Pap test, it would not improve my health							

Perceived Susceptibility

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am at risk of developing cervical cancer							
Women my age are at risk of developing cervical cancer							
Compared to other women my age, I am more likely to develop cervical cancer							

Perceived Severity

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
If I was diagnosed with cervical cancer, it would be a severe threat to my health							
Cervical cancer is a more serious disease than other diseases I know							

Being diagnosed with cervical cancer would be devastating							
---	--	--	--	--	--	--	--

Self-efficacy

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am confident I could have a Pap test if I decided to get one							
I am confident I could have a Pap test even if I was very busy							
I am confident I could have a Pap test even when things make it difficult							

Appendix H: Research Practicum

RESEARCH PRACTICUM

As part of the requirements of the Doctor of Psychology (Clinical) degree at the Australian National University, students are required to complete a Research Practicum: a small research project of an applied nature that relates to the student's main research topic. Proposed projects must be approved by the ANU Clinical Psychology Committee and the Director of the Clinical Psychology Program. Originally, this project was designed as a randomised-controlled trial to be conducted at a community health service for women, however, due to logistical and ethical constraints, the project was redesigned as an experimental online study.

INTRODUCTION

Cervical cancer can be effectively prevented through regular cervical screening (also known as a Pap test) and HPV vaccination. However, almost half of all eligible Australian women (42%) did not undergo cervical screening between 2013 and 2014 (Australian Institute of Health & Welfare, 2016). The literature exploring factors that are likely to influence women's screening behaviour have identified that emotional responses to the procedure, such as embarrassment and anxiety, are key barriers to women attending the screening in a timely fashion (Armstrong, James, & Dixon-Woods, 2012; Fylan, 1998; Nathoo, 1988; Oscarsson, 2011). In addition, results presented in *Chapter 5* of this thesis identified that the women who endorsed embarrassment and anxiety as barriers to screening were more likely to be overdue for screening than the women who did not endorse the barriers.

Such psychological factors have been implicated as important barriers to screening. However, most tested interventions to improve screening uptake have focused on practical factors including reminder letters and other prompts to screen (Albrow et al., 2014; Everett et al., 2011). There is a paucity of research testing psychological interventions that may reduce women's anxiety and embarrassment to improve screening uptake and ultimately their experience of the procedure. Thus, such an intervention will

be tested in this study.

In particular, three prior studies have tested the use of long gowns by women during pelvic examinations (Smith & Smith, 2000; Williams, Park, & Kline, 1992a, 1992b). This research has consistently identified that women who used longer gowns to cover their legs reported less emotional and physical discomfort than the women who used a standard clinical drape. However, these studies all assessed the women's comfort during pelvic and breast examination, rather than during cervical screening, and they used a custom-designed and manufactured gown that is not readily available.

Thus, this study examined whether offering a more easily sourced wraparound skirt to women would influence their intention, and decision to, have a Pap test in the future in hypothetical scenarios. The aim of this project was therefore to provide preliminary data to assist in the development of a future intervention, to be tested in a clinical setting, to address barriers to screening for women who are overdue for screening. Based on the prior relevant literature, the study hypotheses were:

1. Women who were offered the wraparound skirt would be more likely to agree to Pap testing in the scenario than the women who were offered a clinical drape.
2. Women who were offered the wraparound skirt would be more likely to use it than the women who were offered the clinical drape.
3. Women who were offered the wraparound skirt would be more likely to intend to screen in the future than the women who were offered the clinical drape.

METHODS

Participants

Ethics approval for the study was granted by the Australian National University [ANU] Human Research Ethics Committee (Approval 2016/594). Women were recruited to the study via advertisements placed on a number of online discussion boards (e.g.

Whirlpool and Reddit). Women were eligible to participate if they resided in Australia and were fluent in English. They were also required to have previously had a Pap test, since it was expected that women who had not had the procedure before would be unable to engage in the hypothetical scenario. Three-hundred-thirty-nine participants clicked on the study URL and 312 of them completed the study questionnaire (response rate=92%).

Women were aged 19–73 years, with a mean age of 35.7 years ($SD = 11.2$). Most of them reported having a university degree ($n=219$, 70%), and the rest had either no qualification ($n=1$), had completed Year 10 ($n=6$) or Year 12 ($n=27$) or held a diploma ($n=59$, 19%). More than three-quarters of the women were married or in a relationship ($n=246$, 79%), and the remainder were single ($n=59$, 19%), divorced ($n=6$) or widowed ($n=1$). Most women were employed in some capacity ($n=229$, 73%), and the remainder were students ($n=44$, 14%) or unemployed ($n=37$, 12%). Most of the women ($n=205$, 66%) were not currently overdue for Pap testing.

Procedure

Women participated in the study during October 2016. After reading the participant information sheet, they were asked to indicate their consent to participate in the study and then complete the short study questionnaire. They were then provided with a short debriefing sheet that explained cervical cancer screening and provided them with additional online sources of screening information.

The women were asked to take part in a short study to elicit their views on the use of fabric coverings at the time of cervical screening. They were randomly allocated to one of two conditions, as detailed below (see Figure 1 for an outline of the randomisation procedure). After completing the demographic questions and Attitudes to Examinations scale, they were randomised to either the control or experimental condition as follows: women in the control group were shown a photograph of a standard clinical drape that they might wear in a hypothetical screening scenario, whereas women in the experimental group were shown a photograph of a wraparound skirt. They were then asked to read a

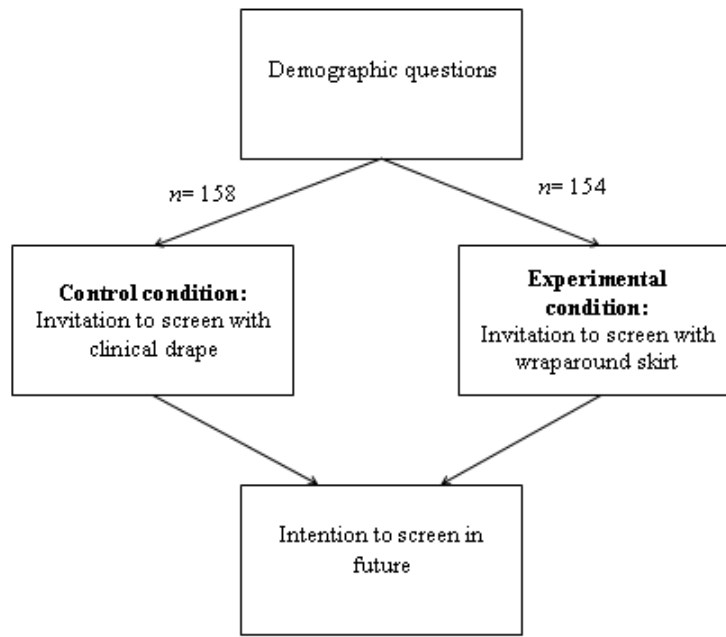


Figure 1. Study design.

short vignette in which they were to imagine being offered a Pap test by their GP (photographs provided after References). Finally, the women were asked to indicate their future screening intentions.

Measures

Women were asked demographic questions including age, relationship status, employment status, and whether they had a regular GP. They were also asked how many times they had previously attended cervical screening and the month and year of their most recent screening attendance.

Vignette and screening decision

Women were then asked to read a short vignette worded as follows: *“Imagine that you have gone to a General Practitioner (GP) for a check-up. The GP asks you when you last had a Pap test, and tells you that you are due to have another one. If you would like to have one today, you can use this wraparound skirt/drape to cover your legs during the Pap test.”*

After reading the vignette, the women were asked to indicate whether or not they would choose to have the Pap test in this scenario, and if they answered 'yes', they were asked whether or not they would choose the covering they were offered.

Intention to attend screening in the future

Three-items were used to assess the women's *future intentions to attend cervical cancer screening*. In line with the guidelines for measuring intentions, a specific time-frame (i.e. 2-years) was referred to in the questions (Conner & Sparks, 2007). The three items were worded as follows: (1) "It is important that I have a Pap test every two-years"; (2) "I am willing to have a Pap test every two-years"; and (3) "I intend to have a Pap test every two- years". The scale showed excellent internal consistency with a Cronbach's alpha of .91.

Statistical analysis

All statistical analyses were conducted using SPSS (version 23; IBM, 2015). *Chi-square* analyses and an independent-samples *t*-test were used to evaluate the effects of allocating the women to either the control or experimental condition, in terms of their future screening intentions and their decision-making in the vignette.

RESULTS

Means, standard deviations, and a correlational matrix of all key study variables are presented in Table 1.

Hypothesis 1

It was hypothesised that the women who were offered a wraparound skirt would be more likely to agree to have a Pap test in the hypothetical scenario, relative to the women who were offered a clinical drape. *Chi-square* analysis indicated that the women who were offered the skirt were *not* more likely to agree to Pap testing than those who were offered the drape ($\chi^2 = 1.6, p=.21$). Thus, the hypothesis was not supported. Frequency distributions for the variables are presented in Table 2.

Table 1

Descriptive statistics and correlations for the key study variables.

	<i>Mean (SD)</i>	<i>N (%)</i>	<i>r (Condition)</i>	<i>r (Intentions)</i>	<i>r (Decided to have Pap test)</i>	<i>r (Decided to use covering)</i>
Age	35.7 (11.2)		-.03	-.09	-.12*	-.02
Condition		154 (49)	1	-.14*	-.07	-.35*
Intentions	17.7 (4.1)		-.14*	1	-.39*	.13
Decided to have Pap test		243 (78)	-.07	.39*	1	n/a
Decided to use covering		177 (57)	-.35*	.13	n/a	1

* significant at $p = 0.05$

Hypothesis 2

It was hypothesised that the women who were offered the wraparound skirt would be more likely to use the covering in the hypothetical scenario, relative to the women who were offered the clinical drape. *Chi-square* analysis indicated that, of the women who elected to have the test, those who were offered the skirt indicated they would be *less* likely to use the covering than the women who were offered the drape ($\chi^2 = 30.2, p < .001$). Thus, the hypothesis was not supported. Frequency distributions of the variables are presented in Table 2.

Table 2

Frequency distributions relating to Hypotheses 2 and 3.

	<i>Decision to have Pap test</i>		<i>Decision to use covering*</i>	
	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>
<i>Control condition</i>	128 (81%)	30 (19%)	112 (87%)	16 (13%)
<i>Experimental condition</i>	115 (75%)	38 (25%)	65 (56%)	51 (44%)

* significant at $p = .05$

Hypothesis 3

It was hypothesised that the women who were offered the wraparound skirt would have greater intentions to screen in the future than the women who were offered the clinical drape. An independent-samples *t*-test indicated that the women who were offered the skirt had *lower* levels of intentions to screen in the future than the women who were offered the clinical drape, such that they scored an average of 1.1 points lower on the scale ($t(303) = 2.4, p = .02$). Thus, this hypothesis was not supported.

DISCUSSION

This study investigated whether offering a wraparound skirt to women influenced their decision to have a Pap test in a hypothetical scenario, their use of the covering, and their intention to have a Pap test in the future. Results indicated that being offered the skirt or drape did not affect the women's decision to have a Pap test in the hypothetical scenario. Further, contrary to expectation, the women who were offered the clinical drape were more likely to choose to use it than the women who were offered the skirt, in the hypothetical scenario, and they also reported a greater level of intention to undergo the screening in the future.

There are a number of possible explanations for the unexpected experimental study results, which are generally in contrast to the findings in the prior literature, particularly the studies examining the effects of a custom-designed gown (Smith & Smith, 2000; Williams et al., 1992a, 1992b). First, the three prior studies evaluating the use of the clinical gowns used different outcome measure to the ones used in this study. Specifically, they used measures of physical and emotional comfort rather than assessing women's decision to have the procedure, likely uptake of the covering and their intentions to undergo the procedure in the future (Smith & Smith, 2000; Williams et al., 1992a, 1992b). Additionally, all prior studies tested the use of the covering in the context of a pelvic and breast examination, rather than a Pap test. Second, a hypothetical scenario is clearly different from an actual screening experience and it may be unlikely to invoke the same feelings of anxiety and embarrassment. Embarrassment and anxiety may also be more related to the insertion of a speculum into the vagina rather than the lack of covering during the procedure which may have minimised women's desire to use the covering at all or to depart from the usual clinical practice (i.e. use of clinical drape). Related to this, most of the women in this sample were up to date with screening, suggesting that they may not have experienced significant barriers to screening such as embarrassment or anxiety.

It is also possible that the women had a preference for using a covering that was ‘clinical’ in appearance rather than a casual day-wear skirt. Indeed, the three prior studies used a gown that was clinical in appearance and did not resemble normal clothing. Finally, women may have also preferred to use a covering that was familiar to them from past Pap tests, rather than a novel drape.

Nonetheless, taken together, the results likely reflect that it is difficult to address women’s perceived psychological barriers to cervical screening by simply altering the way in which they can cover themselves during the procedure. Further, taken together with other research (Smith & Smith, 2000; Williams et al., 1992a, 1992b), the results may simply reflect that using a more modest covering in the clinical context makes women feel more at ease, but, for a variety of reasons, it may not lead to uptake of the covering if given a choice. Additionally, it should be cautioned that intentions are only moderately associated with actual behaviour (Cooke & French, 2008), and so it is possible that the decline in intentions to screen in the experimental study group may not result in a decrease in screening behaviour.

There are also a number of study limitations that may have impacted on the validity of the results. First, a hypothetical scenario was used in this study rather than testing the new covering during actual Pap testing. However, such a vignette approach has previously been used to examine people’s screening intentions and behaviour under different experimental conditions (Gould, 1996). Second, the online nature of the study is likely to have skewed the sample towards younger adults with higher educational attainment (Howard, Rainie, & Jones, 2001). Third, only a short 3-item scale was used to examine intentions to screen in this study, and single item scales were used to assess use of the covering and screening in the context of the hypothetical scenario, although the internal consistency of the 3-item scale was high. Fourth, the aim of the study was to determine whether offering a wraparound skirt to women might increase their uptake of cervical screening, especially in the case that they were overdue for screening or had not previously screened. However, only 18% of the sample was currently overdue for

screening, suggesting that they had not generally experienced significant emotional barriers to screening as reflected in their timely screening attendance. Future research should therefore target women who have already indicated that embarrassment or anxiety makes them less likely to attend screening.

Conclusions

In this study, offering women a standard clinical drape or wraparound skirt to use in a hypothetical scenario did not influence their decision to have a Pap test. In addition, the women who were offered the clinical drape were more likely to choose to use the covering than a more modest wraparound skirt, and they reported greater intentions to screen in the future. The results likely reflect that it is difficult to address the perceived psychological barriers to cervical screening in women by simply altering the way in which they are permitted to cover themselves during the procedure.

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Photos of Study Materials

Clinical drape:



Wraparound skirt:



Appendix I: List of Barriers and Facilitators Cited in Study Two

Barrier	Facilitator
Time	Doctor providing explanation
Embarrassed/shame/self-conscious	Support from family
Pain	After hours appointments
Financial cost	Access to doctor
Discomfort	Test being free
Lack of reminder/invitation	Reminder to screen
Anxiety	Information/education about screening
Don't have a doctor I like/am comfortable with	Female doctor
Appointment availability	Ease of booking appointments
Past history of trauma	Friends also have Pap test
Difficulty accessing doctor	Women only clinic
Anxiety/concern about results	Friendly/supportive doctor
Male doctor	Warm speculum
Bad past experience	Email/text reminder
Menstruation	More comfortable Pap test
Invasive	Less waiting time at doctors
Moving	Childcare
Vaginismus	Pain free/more comfortable test
Don't have a GP	Music during test/better testing environment
I prioritise other health concerns	Pressure from doctor to have test
I don't want one	Having Pap test with other medical procedures
Complacency	Fast results
Disorganised	Modesty
Family priorities	Peace of mind
Low motivation	Friendly reception staff
	Self-collection
	Having more time